

ADDENDUM NUMBER 4

MILWAUKEE COUNTY COURTHOUSE COMPLEX
TELECOMMUNICATIONS NETWORK FIBER & WIRELESS
VIDEOCONFERENCING INFRASTRUCTURE

Site #240
901 North 9th Street
Milwaukee, WI

Project Number: O606-07445-02

Date of Addendum: February 22, 2012

This Addendum to the Contract Documents is issued to modify, explain or correct the original documents, dated October 31, 2011, and is hereby made part of the Contract Documents. Acknowledge receipt of this Addendum in the space provided on the Bid Form, or bid may be rejected.

BIDDING, CONTRACT DOCUMENTS, DRAWINGS AND ADDENDUM 1 THROUGH 3

CHANGE Bid Due Date to March 21, 2012 at 2:00 P.M.

GENERAL BIDDING QUESTIONS AND CLARIFICATIONS

General:

Work in all but closets shall be completed on a second shift. Work in the closets may be completed on first shift. All work shall be coordinated with the building tenants.

Contractors are responsible for their own vehicle parking. The owner will not provide for contractor parking.

There is only storage space on site for contractors gang box.

Closets with existing open electrical panels will be taken care of by the owner.

If hazardous material is encountered, the contractor shall notify the owner and the owner will remediate.

Ceilings are non-plenum. Non-plenum rated cable maybe used.

Closets without adequate floor/wall space will have to be modified in the field by allowance or change order.

Surface raceway shall be Wiremold for 2 or 4 pair cable and Panduit for 50 or 100 pair cable.

There is no demolition or cutover of existing cable/system required in this contract.

Coring shall be completed by contractor requiring it. Include noise mitigation and x-raying of the floor/wall. Include fire stopping at all penetrations.

This contract includes no electrical work so if grounding is not covered in the contract documents this work will be completed by others.

Quote the rack/cabinet/wall-bracket size according to the number of cables coming into the closet and therefore the number of ports needed on the patch panel, thus the size of the rack.

On the drawings 1D stands for one data drop. 2C stands for two camera cables. IP cameras

Copper backbone feeds shall be terminated on backboards on 66 split blocks. Station cables shall be terminated on 66 blocks. Cross connections will be done by the Owner.

SUB-2 copper backbone shall be terminated on 66 split blocks. No cross connection will be required.

If conduit is required for distribution it shall be provided by the Contractor.

Each voice jack gets 2 pair. W-B and W-O pairs go to the first jack and W-G and W-BN go to the second jack.

Disregard the reference to CAT 3 patch panels. Use 66 blocks for the backbone and station cables. The 100 pair cable shall be terminated on SiemensM1-50 66 split blocks. No cross connection is required in this contract.

50 micron shall be either aqua or orange. Armored cable is preferred.

ST connectors are required. Contractor to provide (supply and install) fire retardant plywood.

Panduit jacks shall be provided.

Power poles for data shall be provided by the Contractor. Wire Mold as shown by the specification or equivalent in Panduit.

SPECIFICATIONS

DIVISION 271000 Network Cabling System – Category 6
REPLACE pages 271000-1 through 271000-15 with pages 271000-1 through 271000-16 attached to and issued as part of this Addendum 4.

DRAWINGS

REPLACE the following Sheet No.:TC32, TC32-A, TC35, TC36, TC37, TC38, TC39, TC40, TC42, TC43, TC45, TC46, TC47, TC48, TC49, and TC50 attached to and issued as part of this Addendum 4.

End of Addendum No. 4

Teleco Systems Inc.
7777 Bonniwell Rd.
Mequon, WI 53097
414-350-8218
Web Site www.telecosystems.com

Product Guide Specification

DIVISION 271000

NETWORK CABLING SYSTEM – CATEGORY 6

PART 1 GENERAL
(Reference Division 271000 Communications Structured Cabling and Enclosures

1.1 SECTION INCLUDES

- A. Backbone Cabling System
 - 1. Voice Backbone Cabling
 - 2. Data Backbone Cabling
 - 3. Backbone Termination Hardware
 - 4. Data Backbone Termination Hardware
- B. Communications Equipment Room
 - 1. Telecommunications closet hardware.
- C. Horizontal Cabling System
 - 1. Copper
 - 2. Fiber
 - 3. Coax
 - 4. Faceplates & Connectors
 - 5. Power Poles (Data)
- D. Work Area and Patch Cord Cable Assemblies
 - 1. Custom
 - 2. Media Converters
 - 3. Patch, Station, Cross-Connects
 - 4. Power Poles

1.2 RELATED SECTIONS

- A. Division 078400 - Firestopping
- B. Section 127000 - Systems Furniture.
- C. Section 236740 - Air Terminal Units.
- D. Section 237103 - Diffusers, Registers, and Grilles.
- E. Section 270500 - Common Materials and Methods for Communications.
- F. Section 271000 – Cabling Enclosures.
- G. Section 271130 – Cable Management and Ladder Rack.
- H. Section 273000 – Voice Systems.

1.3 REFERENCES

- A. This Technical Specification and Associated Drawings
- B. ANSI/TIA/EIA 568-B.2-1 Performance Specification for 4-Pair 100 Ohm Category 6 Cabling (latest revision)
- C. ANSI/TIA/EIA-568-B Commercial Building Telecommunications Cabling Standard – April, 2001
- D. ANSI/TIA/EIA-569-B Commercial Building Standard for Telecommunications Pathways and Spaces - February, 2004
- E. ANSI/TIA/EIA-606-A Administration Standard for the Telecommunications Infrastructure of Commercial Buildings – May, 2002
- F. ANSI/J-STD-607-A Commercial Building Grounding (Earthing) and Bonding Requirements for Telecommunications - October, 2002
- G. Building Industries Consulting Services, International (BICSi) Telecommunications Distribution Methods Manual (TDDMM) – 10th edition, 2003
- H. National Fire Protection Agency (NFPA) - 70, National Electrical Code (NEC) -2002

1.4 SYSTEM DESCRIPTION

- A. Telecommunications horizontal cabling system shall ensure efficient voice and data signal transmission up to 200MHz (change to 300MHz) performance in compliance to ANSI/TIA/EIA/568-B for Category 6 Systems. The system shall ensure efficient operation from patch panels in the telecommunications room to the workstation outlets. System shall be designed and approved for use above drop ceiling spaces and in Milwaukee County Safety Building vaulted ceiling attic spaces.
- B. Cabling system is based on home run cabling requirements. Distribution is achieved above or below ceiling or access floor through use of individual 4-pair Category 6 rated cables and components. The cable will distribute telecommunication signals from patch panels located in the telecommunications room.

1.5 SUBMITTALS

- A. Cabling System Labeling: The contractor shall develop and submit for approval a labeling system for the cable installation based on TIA/EIA-606-A standards. Customer will negotiate an appropriate labeling scheme with the successful contractor. At a minimum, the labeling system shall clearly identify all components of the system: racks, cables, panels and outlets. The labeling system shall designate the cables origin and destination and a unique identifier for the cable within the system. Racks and patch panels shall be labeled to identify the location within the cabling system infrastructure. All labeling information shall be recorded on the as-built drawings and all test documents shall reflect the appropriate labeling scheme.

All label printing will be machine generated using labeling software and laser printers obtained from cabling system manufacturer. Self-laminating labels will be used on cable jackets, appropriately sized to the OD of the cable, and placed within view at the termination point on each end. Outlet labels will be the manufacturer's labels made of white card stock or self-adhesive polyester where applicable.

- B. As-Built Drawings: The installation contractor will be provided with 2 sets of D or E-size drawings at the start of the project. One set will be designated for as the central location to document all as-built information as it occurs throughout the project. The central set will be maintained by the Contractor's Foreman on a daily basis, and will be available to the Technical representative upon request during the course of the project. Anticipated variations from the build-to drawings may be for such things as cable routing and actual outlet placement. No variations will be allowed to the planned termination positions of horizontal and backbone cables, and grounding conductors unless approved in writing by the Owner.

The Contractor shall provide the central drawing set to the owner at the conclusion of the project. The marked up drawing set will accurately depict the as-built status of the system including termination locations, cable routing, and all administration labeling for the cabling system. In addition, a narrative will be provided that describes any areas of difficulty encountered during the installation that could potentially cause problems to the telecommunications system.

- C. Test Documentation: Test documentation shall be provided in both a three ring binder(s) and electronic format on appropriate media, within three weeks after the completion of the project. The binder(s) shall be clearly marked on the outside front cover and spine with the words "Test Results", the project name, and the date of completion (month and year). The binder shall be divided by major heading tabs, Horizontal and Backbone. Each major heading shall be further sectioned by test type. Within the horizontal and backbone sections, scanner test results (Category 3, 5E, or 6), fiber optic power meter attenuation test results, OTDR traces, and green light test results shall be segregated by tab. Test data within each section shall be presented in the sequence listed in the administration records. The test equipment by name, manufacturer, model number, serial number and last calibration date will also be provided at the end of the document. Unless a more frequent calibration cycle is specified by the manufacturer, an annual calibration cycle is anticipated on all test equipment used for this installation. The test document shall detail the test method used and the specific settings of the equipment during the test.

Scanner tests shall be printed on 8-1/2" x 11" paper, and in native format of the tester used. Hand written test results (attenuation results and green light results) shall be documented on the attached test form (Appendix C). Electronic native format test results shall include the test equipment manufactures software for reading and interpreting test results. OTDR test

results shall be in electronic format as well as printed or attached and copied on 8-1/2" x 11" paper for inclusion in the test documentation binder.

When repairs and re-tests are performed, the problem found and corrective action taken shall be noted, and both the failed and passed test data shall be co-located in the binder.

- D. Warranty: The contractor shall provide a system warranty covering the installed cabling system against defects in workmanship, components, and performance, and follow-on support after project completion. Warranty submittal shall comply with manufactures requirements for warranty to eliminate possible problems and delays.

1.6 QUALITY ASSURANCE

- A. Each cable shall be tested for continuity and wire-map on all pairs and/or conductors. Voice back-bone twisted-pair voice cables shall be tested for continuity, pair reversals, shorts, and opens using a "green light" type test set. Twisted-pair data cables shall be tested for the all of the above requirements, plus tests that indicate installed cable performance. These data cables shall be tested using a Level III cable scanner.

- a. Continuity/Wire Map
Each pair of each installed cable shall be tested using a "green light" test set that shows opens, shorts, polarity and pair-reversals and splits. Shielded/screened cables shall be tested with a device that verifies shield continuity in addition to the above stated tests. The test shall be recorded as pass/fail as indicated by the test set in accordance with the manufacturers recommended procedures, and referenced to the appropriate cable identification number and circuit or pair number. Any faults in the wiring shall be corrected and the cable re-tested prior to final acceptance. As an alternate, each wire shall be tested as part of an autotest procedure to comply with ANSI/TIA/EIA/568-B standard with the Level III tester/scanner.

- b. Length
Each installed cable shall be tested for installed length using a TDR type device. The cables shall be tested from patch panel work area outlet as appropriate. The cable length shall conform to the maximum distances set forth in the ANSI/TIA/EIA-568-B Standard. Cable lengths shall be recorded, referencing the cable identification number and circuit or pair number. For multi-pair cables, the longest pair length shall be recorded as the length for the cable.

B. Performance Verification

- 1. Copper
 - 1. Category 6 data cabling systems shall be performance verified using an automated test set. This test set shall be a Level III qualified tester approved by the cabling manufacturer. The test shall be permanent link which tests for the following performance parameters:
 - 1. Wire Map
 - 2. Length
 - 3. Insertion Loss
 - 4. Pair-to-Pair Near End Crosstalk (NEXT)
 - 5. Power Sum Near End Crosstalk (PSNEXT)
 - 6. Equal Level Far End Crosstalk (ELFEXT)

- 7. Power Sum Equal Level Far End Crosstalk (PSELFEXT)
- 8. Return Loss (RL)
- 9. Propagation Delay
- 10. Delay Skew

2. Category 6 data cable shall be performance verified using an automated test set. Test results shall be automatically evaluated by the equipment, using the most up-to-date criteria from the ANSI/TIA/EIA-568-B.2.1 Standard, and the result shown as pass/fail. Test results shall be printed directly from the test unit or from a download file using an application from the test equipment manufacturer. The printed test results shall include all tests performed, the expected test result and the actual test result achieved.

2. Fiber

- 1. Attenuation:
 - a. The backbone optical fiber cabling link segment shall be tested in at least one direction at both operating wavelengths to account for attenuation deltas associated with wavelength. Singlemode backbone links shall be tested at 1310 nm and 1550 nm in accordance with ANSI/TIA/EIA-526-7, Method A.1, One Reference Jumper. Multimode backbone links shall be tested at 850 nm and 1300 nm in accordance with ANSI/EIA/TIA-526-14A, Method B, One Reference Jumper. Because backbone length and the potential number of splices vary depending upon site conditions, the link attenuation equation shall be used to determine acceptance values based upon this Standard's component requirement at each of the applicable wavelengths.

Link attenuation is calculated as:

Link Attenuation = Cable Attenuation + Connector Insertion loss +

Splice Insertion loss where:

Cable Attenuation (dB) =

Attenuation Coefficient (dB/km) X Length (km)

Attenuation Coefficients are:

- 3.5 dB/km @ 850 nm for multimode
- 1.5 dB/km @ 1300 nm for multimode
- 0.5 dB/km @ 1310 nm for singlemode outside plant cable
- 0.5 dB/km @ 1550 nm for singlemode outside plant cable
- 1.0 dB/km @ 1310 nm for singlemode inside plant cable
- 1.0 dB/km @ 1550 nm for singlemode inside plant cable

Connector Insertion loss (dB) =

number of connector pairs X connector loss (dB)

Example: = 2 X 0.75 dB = 1.5 dB

Splice Insertion loss (dB) = number of splices (S) X splice loss (dB)

Example: = 2 X 0.3 dB = 0.6dB

2. Distance and Footprint

- a. OTDR testing will be for length verification only and be conducted in accordance with ANSI/TIA/EIA-526-7
- b. Documentation to be recorded for OTDR test results shall include:
 - 1) Date of the test

- 2) Description of equipment used; manufacturer model number and serial number
- 3) Date of latest equipment calibration
- 4) Test personnel
- 5) Trace of the fiber or cabling link
- 6) Fiber identifier or circuit identifier with fiber length and fiber attenuation of events
- 7) Test wavelength(s)

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Delivery: Deliver materials to site in manufacturer's original, unopened, protective containers and packaging, with labels clearly identifying product name and manufacturer.
- B. Storage: Store materials in secure, clean, dry area indoors in accordance with manufacturer's instructions.
- C. Handling: Protect materials and finish from damage and moisture during handling and installation.

1.8 WARRANTY

The contractor shall provide a system warranty covering the installed cabling system against defects in workmanship, components, and performance, and follow-on support after project completion.

A. Installation Warranty

The contractor shall warrant the cabling system against defects in workmanship for a period of one year from the date of system acceptance. The warranty shall cover all labor and materials necessary to correct a failed portion of the system and to demonstrate performance within the original installation specifications after repairs are accomplished. This warranty shall be provided at no additional cost to the Owner.

B. Cabling System Warranty

The contractor shall facilitate a 25-year system performance warranty between the manufacturer and the Owner. A component warranty shall be provided which warrants functionality of all components used in the system for 25 years from the date of acceptance. The performance warranty shall warrant the installed horizontal copper, and both the horizontal and the backbone optical fiber portions of the cabling system. Copper links shall be warranted against the performance minimum expected results defined in ANSI/TIA/EIA-568-B.2-1. Fiber optic links shall be warranted against the link and segment performance minimum expected results defined in ANSI/TIA/EIA-568-B.1.

C. Post Installation Maintenance

The contractor shall furnish an hourly rate with the proposal submittal which shall be valid for a period of one year from the date of acceptance. This rate will be used when cabling support is required to affect moves, adds, and changes to the system (MACs). MACs shall not void the Contractor's nor manufacturer's warranty.

PART 2 PRODUCTS

2.1 MANUFACTURER

- A. CommScope
- B. Panduit
- C. AMP
- D. General
- E. Belden
- F. Corning, (fiber)

2.2 BACKBONE CABLING SYSTEM

A. Voice Backbone Cabling

Voice backbone cabling shall be 24 AWG, 100-pair UTP , UL/NEC CMR rated, with a gray PVC jacket. Cable shall be third party verified to comply with TIA Category 3 requirements. Cable shall be supplied on 1000 ft. reels. A coupled bonding conductor will be installed within the riser bundle and bonded and grounded at each end.

Voice backbone cables shall be terminated in rack mount Category 3 patch panels. (change to **on 66 Blocks**) Patch panels wired per the wiring specification of the PBX system. Patch panel modular jacks shall be configured as 6-port, replaceable modules. The front of each module shall be capable of accepting 9mm to 12mm labels. Each port shall be capable of accepting an icon to indicate its function. Patch panels shall terminate the building cabling on 110-style insulation displacement connectors. Patch panels must be UL Listed under file number E81956. **THE ABOVE AND BELOW IN RED GETS TAKEN OUT.**

The following part number is shown for example only. Other manufacturers that exhibit a similar spec are allowed to participate. Submittals in the bid shall show which manufacturer has been chosen for the bidder's response.

Panduit Voice Backbone Termination Hardware:

Category 3 110 Punchdown System Part No. P110B100R4WJY

B. Data Backbone Cabling

Twelve strand fiber optic cable shall be utilized to provide backbone connectivity between the Data MC and each TR. The optical fiber cable shall consist of one subunit bound together by a PVC outer jacket. The subunit shall contain twelve tight-buffered 50-micron fibers surrounded by aramid strength members and the yellow PVC jacket. The cable shall have a UL rating of [OFNR (Riser) or OFNP (Plenum)]. The outside diameter of each unit shall be 6.2 mm making the overall cable dimensions 7.2 mm x 13.4 mm. The cable jacket shall be orange for multimode. The cable shall provide a maximum attenuation of 3.5 dB/km @ 850 nm and 1.5 dB/km @ 1300 nm. The bandwidth of the cable shall be 500 MHz/km @ 850 nm and 500 MHz/km @ 1300 nm. *The following part number is shown for example only. Other manufacturers that exhibit a similar spec are allowed to participate. Submittals in the bid shall show which manufacturer has been chosen for the bidder's response.*

OFNR (OFNR is the designation given by the National Fire Protection Association (NFPA) to riser fiber-optic cables which contain no electrically conductive component and which are certified for use in riser applications)

50/125 10Gb/s 12 Fiber Riser cable, OFNR Multimode Panduit # FODRX12Y
Substitute Panduit Armored Fiber cable for inner duct elimination, Part number, FSPPR912Y

Each fiber optic cable shall be terminated in the Data MC and TR's in 24 port rack mount enclosures providing protection to the terminated fibers. The use of pre-terminated cassettes is recommended. The optical fiber patch panel(s) shall each be capable of containing 24 fibers. The connectors shall be field-installable, requiring no epoxy, no polishing and no crimping. The connectors shall meet the intermateability requirements of TIA/EIA-604-12. Connector performance requirements are listed in Table 1:

Optical Fiber Jack Typical Performance Characteristics

Test Description	FOTP	Requirement (dB)
Visual and Mechanical Inspection	13	TIA/EIA-604-2 or -3 Intermateability
Attenuation	34	≤ 0.75
Return Loss	107	≥ 20
Low Temperature (0°C for 4 days)	188	≤ 0.3 change
Temperature Life (55°C for 14 days)	7	≤ 0.3 change
Humidity (90 to 95% @ 40°C for 4 days)	5	≤ 0.3 change
Impact (8 drops from 1.8 meters)	2	≤ 0.75 IL, ≥ 20 RL
Durability (500 cycles)	21	≤ 0.75 IL, ≥ 20 RL
Cable Retention (0°C and 90°C)	6	≤ 0.75 IL, ≥ 20 RL
Flex (100 cycles)	1	≤ 0.75 IL, ≥ 20 RL
Twist (10 cycles)	36	≤ 0.75 IL, ≥ 20 RL

Table 1

The following part number is shown for example only. Other manufacturers that exhibit a similar spec are allowed to participate. Submittals in the bid shall show which manufacturer has been chosen for the bidder's response.

AMP **NETCONNECT** Data Backbone Termination Hardware: Fiber connectors shall be LC connectors.

MT-RJ Patch Panel Jack, 50-micron	Part No. 1588880-1
MT-RJ Patch Panel Jack, XG	Part No. 1558880-3
24 Port Slim-Line MT-RJ Enclosure, Black	Part No. 1206704-4

THE ABOVE IN **RED** GETS TAKEN OUT.

2.3 TELECOMMUNICATIONS ROOM

- A. The telecommunication room shall house racks, voice termination fields and required cable routing hardware. Racks shall be placed in a manner that will allow a minimum of 3 feet of clearance from the front and rear mounting surfaces and on one side on racks. If one mounting rail of the rack is placed against a wall, the mounting rail shall be no closer than 6" to the wall to allow room for vertical management. Where there is more than one rack, the racks shall be ganged with vertical management hardware to provide interday management. Ganged rack frames will be placed in a manner that will allow a minimum of 3 feet of clearance from the front and rear mounting surfaces and on one side of the ganged assembly

In all telecommunications rooms the racks shall be on the opposite end of the room from the voice termination fields. Voice termination fields shall be mounted on Homaco Wall Adapters or equal, Part Number WPM-19-68 or 4' x 8' x .75" virgin fire retardant plywood, unless otherwise noted in drawings, and shall be on the opposite side of the room from the room entrance. Backbone termination fields shall be mounted to the left of the horizontal voice fields. Wall, ceiling and floor penetrations shall be sleeved and firestopped. The contractor shall provide Innerduct (or ask for approval for armored cable) for all backbone fiber runs. Contractor shall provide required ladder and wall mount management rings to properly

support and dress cables from conduits to racks and frames.

2.4 HORIZONTAL CABLING SYSTEM

A. Telecommunication Room Hardware:

All hardware specified is designed to be mounted on a standard 19" telecommunications rack.

1. Horizontal Cabling Racks

Horizontal cabling racks shall be standard EIA 19" wide x 7' tall telecommunications racks. They are to be self-supporting and constructed from 6061-T6 aluminum with a black painted finish. If there is not room for the above rack then the rack of choice shall be a Homaco **Swing-EZ Wall Racks** part number 19-48-T18D or equal.

2. Vertical Cable Managers

Vertical cable managers shall be designed to install on a standard EIA 19" x 7' telecommunications rack and shall be 4" x 5" front and back and 78" high. They are to be double-sided with finger ducts and removable covers. The base of the vertical cable managers are to be constructed of black aluminum and the finger ducts and cover constructed of black plastic. Vertical cable managers shall be made by the same manufacturer as the cabling rack. **THE ABOVE IN RED GETS TAKEN OUT. AND THE BELOW IN YELLOW GETS INSERTED.** The vertical cable manager shall be capable of mounting to EIA racks to manage cables on the front and rear of the rack. The manager shall be molded out of plastic and possess cable management fingers and pass through holes. The fingers shall provide integral bend radius control and be spaced so that the gaps between the fingers align with EIA rack spaces. The pass through holes shall provide bend radius control and slots that can be used for securing of cable straps. The vertical manager shall have a dual hinged cover that can be opened to the left or right 110 degrees. The manager shall be able to accept wire retainers that can be snapped on to the cable management fingers." Front and rear vertical manager. Dimensions: 83.0"H x 4.9"W x 12.0"D (2108mm x 125mm x 306mm)

3. Patch Panels

Patch panels shall have a capacity of 24-48 ports and be 1U – 2U of rack space high. Ports shall be blank to accept snap-in unshielded RJ45 jacks in four snap-in interface housings, six jacks per housing. **INSERT Or 6 holders with 4 Jacks each. It is preferred that the jacks be front mount replaceable.** Patch panel base shall be constructed of 16 gauge cold rolled steel and powder coated with a polyurethane finish. Interface housings shall be constructed of UL 94V-0 rated polyphenylene oxide and provide space for port identification labeling. Patch panel shall be made by the same manufacturer as the cabling rack.

4. Jacks

- a. Category 6 modular (data) jacks used in the Jack Patch Panels shall be unkeyed 4-pair and shall fit in a square opening. Modular jacks shall be terminated using a non-impact termination tool to eliminate connector damage and promote consistent terminations. The jacks shall be color-coded for both T568A and T568B wiring. Each jack shall be wired to T568B. Modular jacks shall be UL Listed under file number E81956.

5. Horizontal Cable Managers

Horizontal cable managers shall be capable of front and rear cable management, and have capacity for 48 cables in both front and rear. They shall be designed to be installed on a standard EIA 19" telecommunications rack and shall be 1.5"x3.0" front and 1"x4" back. They are to be double-sided with finger ducts and removable covers. The base of the vertical cable managers are to be constructed of black aluminum and the finger ducts and cover constructed of black plastic. Horizontal Cable Managers shall be made by the same manufacturer as the cabling rack. TAKE OUT YELLOW ABOVE AND INSERT RED BELOW. "The high capacity horizontal cable managers shall be capable of managing high performance cable on the front and rear of any 19" EIA rack. The high capacity horizontal cable managers shall be molded plastic with bend radius fingers that protect the cable. The fingers shall be inset towards the rack to allow easy access to patch cords and terminations. Standard pass through holes shall incorporate bend radius control. Dual hinged covers shall allow access to the cable pathway. Horizontal Cable Manager High Capacity Front and Rear 2 Rack Units .35"H x 19.0"W x 13.1"D (88mm x 482mm x 332mm)." "

B. Horizontal Cable:

- a. Category 6 Cabling: Plenum
 - b. There is not a requirement for Plenum cable in the Milwaukee County Safety Building, unless a location requires it.

- 2. Category 6 Cabling: Non-plenum
 - Horizontal cabling shall be 24 AWG, 4-pair UTP, UL/NEC/NFPA CMR rated, with a PVC jacket. Cable jacketing shall be lead-free. Cable shall be 3rd party verified to ANSI/TIA/EIA-568-B.2.1 and meet the standard Category 5e performance requirements. Cable shall be supplied on wooden reels or in reel-in-box. Cable shall be safely listed to ANSI/UL 1666. Cable shall be UL Listed for safety, and UL verified for performance as well as be a part of the UL verification program. The following manufacturers are approved providing they can adhere to the following performance specifications.

- a. Belden
- b. CommScope
- c. General
- d. Panduit

Insertion Loss (Attenuation) dB/100m					NEXT (dB)				
Cat6 CMR			Cat6 CMP		Cat6 CMR			Cat6 CMP	
Frequency MHz	Standard	Maximum	Typical	Maximum	Standard	Minimum	Typical	Minimum	Typical

0.772	1.8	1.6	1.6	1.6	1.5	76.0	80.0	87.0	86.0	93.0
1	2.0	1.8	1.8	1.8	1.7	74.3	78.0	86.0	85.0	92.0
4	3.8	3.8	3.7	3.5	3.4	65.3	68.0	77.0	73.0	82.0
8	5.3	5.3	5.0	4.9	4.8	60.8	67.0	76.0	72.0	81.0
10	6.0	5.8	5.5	5.6	5.4	59.3	66.0	72.0	71.0	76.0
16	7.6	7.4	7.0	7.1	6.9	56.2	66.0	70.0	70.0	75.0
20	8.5	8.4	7.9	7.9	7.7	54.8	55.0	64.0	66.0	68.0
25	9.5	9.2	8.9	8.4	8.7	53.3	55.0	62.0	59.0	66.0
31.25	10.7	10.3	10.1	9.9	9.8	51.9	55.0	65.0	59.0	69.0
62.5	15.4	14.8	14.5	14.4	14.3	47.4	54.0	61.0	57.0	65.0
100	19.8	18.7	18.5	18.8	18.5	44.3	52.0	56.0	55.0	60.0
200	29.0	27.0	27.8	27.9	27.5	39.8	50.0	52.0	53.0	56.0
250	32.8	30.5	32.0	31.8	31.3	38.3	48.0	52.0	52.0	56.0
300	36.4	33.5	35.0	35.5	34.9	37.1	45.0	51.0	48.0	55.0
350	39.8	37.0	37.0	38.9	36.3	36.1	42.0	49.0	45.0	52.0
400	43.0	39.3	40.1	41.1	39.6	35.3	39.0	45.0	42.0	49.0
500	48.9	44.3	46.2	48.6	45.4	33.8	38.0	43.0	41.0	46.0
550	51.8	46.4	49.0	51.7	48.3	33.2	37.0	40.0	40.0	43.0
600	54.5	49.5	51.2	54.5	50.8	32.6	34.0	33.0	37.0	35.0

Table 2

C. Work Area

1. Work area outlets shall be configured with a minimum of 3 Category 6 cables with appropriate Category 6 connectors as listed in section 2.4.D.

D. Horizontal Connectors

1. Category 6 modular (data) jacks shall be unkeyed 4-pair and shall meet the Category 6 performance requirements. **Modular jacks shall fit in a 790° X .582° opening**
Delete the above **fed** wording. Modular jacks shall be terminated using a non-impact termination tool to eliminate connector damage and promote consistent terminations. The jacks shall be color-coded for both T568A and T568B wiring. Each jack shall be wired to T568B. Modular jacks shall be UL Listed under file number E81956.

2.5 WORK AREA AND PATCH CORD CABLE ASSEMBLIES

- A. Patch cords used at the telecommunication rack and at the workstation shall be Category 6, 4-pair assemblies. Patch cords shall be factory-assembled by the manufacturer of the cabling system. Each workstation shall require one 10-foot Category 6 patch cord. The phone cords shall be provided by the owner.

In the telecommunications room, 8-, 10-, and 12-foot patch cords shall be provided to cross-

connect between the data patch panels and network equipment. One patch cord per user outlet shall be provided. The total quantity of telecommunications room end patch-cords required are to be equally divided between three assembly lengths. Optical patch cords shall be provided to patch the network equipment to the enclosures and shall be 1 meter in length. **LC CONNECTORS SHALL BE USED TAKE OUT RED INSERT YELLOW. MT-RJ to MT-RJ, MT-RJ to SC or MT-RJ to ST** for fiber optic patch cords shall be provided depending upon LAN electronic interface. Four optical patch cords are provided for each closet.

AMP NETCONNECT Patch Cords:

Cat 6 Patch Cable, 8 ft, TBD	Part #:
Cat 6 Patch Cable, 10 ft, TBD	Part #:
Cat 6 Patch Cable, 12 ft, TBD	Part #:
Optical Fiber, Zip Cord, Laser enhanced Aqua	Part #:
Optical Fiber, Zip Cord, Laser enhanced Aqua	Part #:
Optical Fiber, Zip Cord, Laser enhanced Aqua	Part #:

B. Power Poles

- a. Product shall be Wiremold 25DTPC, where needed. These poles shall be installed for data cable only. If electrical is needed at a later date then the County shall prepare a separate bid on that. **Panduit power poles are acceptable. INSERT YELLOW HIGHLIGHTED ABOVE INTO SPEC**

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine areas to receive network cabling system. Notify Architect of conditions that would adversely affect installation or subsequent use. Do not proceed with installation until unsatisfactory conditions are corrected.

3.2 INSTALLATION

A. Backbone Cabling

All backbone cables shall be installed in the following manner:

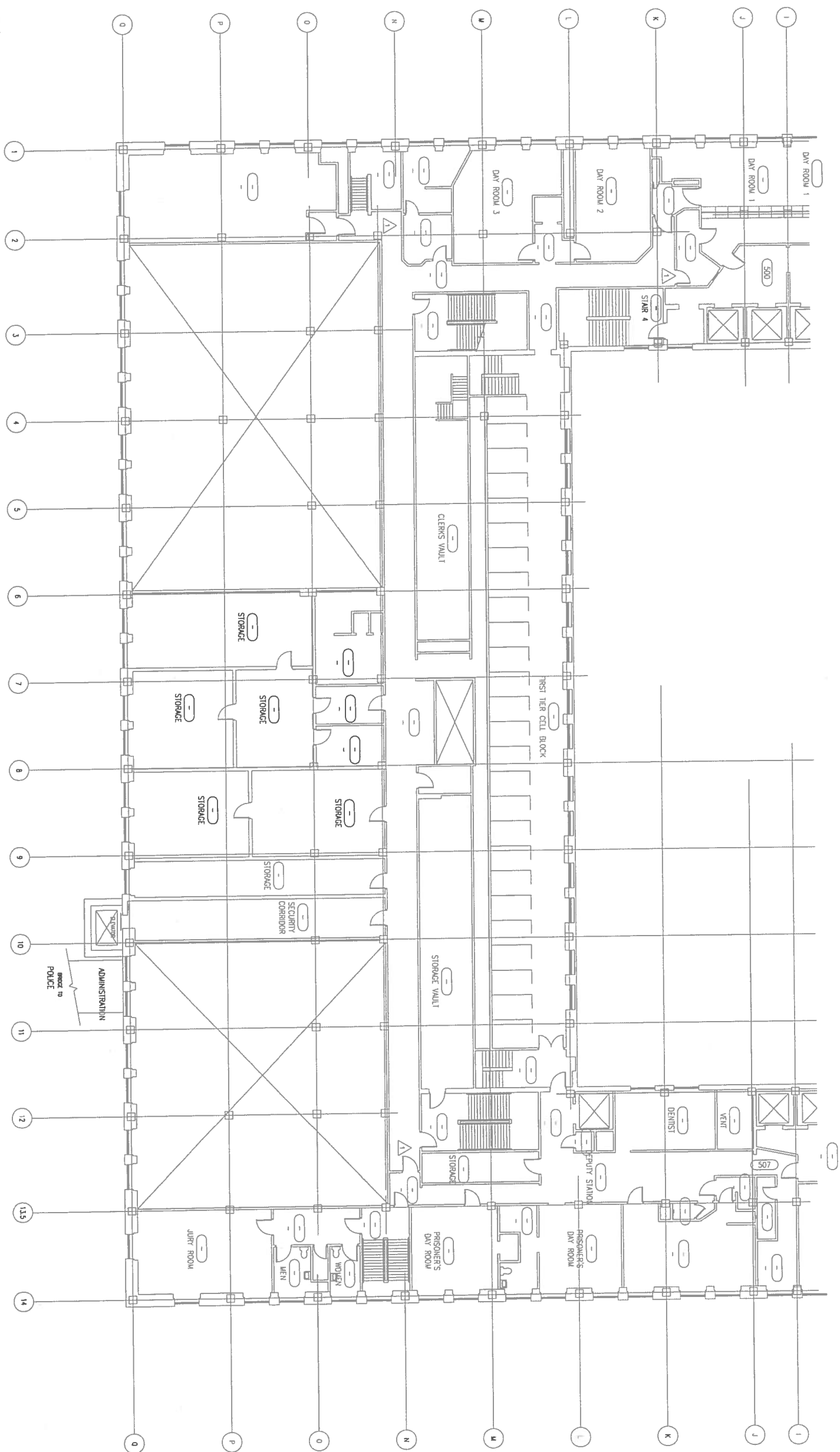
- 1. Backbone cables shall be installed separately from horizontal distribution cables.
- 2. Where cables are housed in conduits, the backbone and horizontal cables shall be installed in separate conduits or in separate innerducts within conduits.
- 3. Where cables are installed in an air return plenum, the cable shall be installed in conduit, or plenum cable shall be installed in a plenum innerduct to provide protection to the cable.
- 4. Where backbone cables and distribution cables are installed in a cable tray or wireway, backbone cables shall be installed first and bundled separately from the horizontal distribution cables.

B. Telecommunication Room Hardware










- 1. Racks shall be installed in the following manner:
 - a) Racks shall be securely attached to the concrete floor using 3/8" hardware.
 - b) Wall racks shall be securely attached to the walls using toggle bolts. Weight testing shall be done per specifications. (100 lb maximum weight limit)
 - c) All racks shall be grounded to the telecommunications ground bus bar in accordance with Section 9.0 of this document.
 - d) Rack mount screws (#12-24) not used for installing fiber panels and other hardware shall be bagged and left with the rack upon completion of the installation.
 - e) All installed racks shall also comply with regional Seismic requirements.
- 2. Cable Tray and wireracks shall be installed in the following manner and in compliance to manufacturers recommendation:
 - a) Trays shall be securely attached to the walls and ceiling using appropriate hangers for the tray and not attached to any other ceiling support fixtures.
 - b) All trays shall be grounded and bonded to the telecommunications ground bus bar in accordance with Section 9.0 of this document.
 - c) Screws and other mounting hardware not used for installing tray and mounting hardware shall be packaged and left in telecommunications room for the end-user
- C. Horizontal Distribution Cable Installation
 - 1. Cable shall be installed in accordance with manufacturer's recommendations and best industry practices.
 - 2. Cable raceways shall not be filled greater than the NEC maximum fill for the particular raceway type.
 - 3. Cables shall be installed in continuous lengths from origin to destination (no splices) unless specifically addressed in this document.

- 4. The cable's minimum bend radius and maximum pulling tension shall not be exceeded.
- 5. Any cable damaged or exceeding recommended installation parameters during installation shall be replaced by the contractor prior to final acceptance at no cost to the Owner.
- 6. Cables shall be identified by a self-adhesive label in accordance with the System Documentation Section of this specification. The cable label shall be applied to the cable behind the faceplate on a section of cable that can be accessed by removing the cover plate.
- 7. Unshielded twisted pair cable shall be installed so that there are no bends less than four times the cables outside diameter (4 X cable O.D.) at any point in the run.
- 8. Pulling tension on 4-pair UTP cables shall not exceed 25-pounds for a single cable or cable bundle.
- D. Coordinate installation of network cabling system with other work in progress.

END OF SECTION



LEGEND

	- EXISTING VOICE
	- DATA LOCATION
	- IP CAMERA
	- LOCATION W/DATA
	- PROPOSED VOICE
	- DATA LOCATION
	- (117) - INDICATES NEW ROOM NUMBER
	- (136) - INDICATES OLD ROOM NUMBER
	- PRT - PRINTER

NOTES:

1. FOR CABLE RUNS SEE CABLING PLANS
2. EXISTING DATA POINTS SHOWN ARE TO BE REWORKED WITH NEW CABLE AND PLATES

NOTES.

1. FOR CABLE RUNS SEE
CABLING PLANS

2. EXISTING DATA POINTS SHOWN
ARE TO BE REWORKED WITH NEW
CABLE AND PLATES

SAFETY BUILDING - FIFTH FLOOR PLAN

SCALE: 1/8" = 1'-0" (0.30" = 427)

MILWAUKEE COUNTY DEPARTMENT OF
TRANSPORTATION AND PUBLIC WORKS

CITY CAMPUS 2711 W. WELLS ST. SECOND FLOOR MILWAUKEE, WI 53208



Milwaukee County Courthouse Safety Building Telecommunications Design

REVISIONS

DESIGN FIRM	TELECO SYSTEMS, INC.
HEARTY HOEL, PRESIDENT	
7777 BOWENWELL RD	
ANDERSON, INDIANAPOLIS 46247	
TEL (317) 377-6433	
FAX (317) 377-6433	
www.telecosystems.com	
DRAWN BY:	
PAR	
SCALE:	
AS NOTED	
DATE	
OCTOBER, 2011	
PROJECT	
0606-07445	
SITE NO:	
240	
BUILDING NO	
30	

BID DOCUMENT

SHEET DESCRIPTION:

FIFTH FLOOR PLAN B - VOICE & DATA

BID DOCUMENT

SHEET DESCRIPTION:

FIFTH FLOOR PLAN B - VOICE & DATA

SHEET DESCRIPTION:
FIFTH FLOOR PLAN B - VOICE & DATA

SCHEDULE - FIFTH FLOOR PLAN A

POINT #	CLOSET DESIGNATION	VOICE LOCATION	DATA LOCATION	ROOM #	CAMERA #	WIRELESS ACCESS POINT	POLE #
5A-001	S5-A	S5APX-XXX	S5APX-XXX	506-L			
5A-002	S5-A	S5APX-XXX	S5APX-XXX	506-L			
5A-003	S5-A	S5APX-XXX	S5APX-XXX	506-L			
5A-004	S5-A	S5APX-XXX	S5APX-XXX	506-L			
5A-005	S5-A	S5APX-XXX	S5APX-XXX	506-N			
5A-006	S5-A	S5APX-XXX	S5APX-XXX	506-N			
5A-007	S5-A	S5APX-XXX	S5APX-XXX	506-N			
5A-008	S5-A	S5APX-XXX	S5APX-XXX	506-N			
5A-009	S5-A	S5APX-XXX	S5APX-XXX	506-P			
5A-010	S5-A	S5APX-XXX	S5APX-XXX	502-L			
5A-011	S5-A	S5APX-XXX	S5APX-XXX	HALLWAY			
5A-012	S5-A	S5APX-XXX	S5APX-XXX	HALLWAY			
5A-013	S5-A	S5APX-XXX	S5APX-XXX	HALLWAY			
5A-014	S5-A	S5APX-XXX	S5APX-XXX	HALLWAY			
5A-015	S5-A	S5APX-XXX	S5APX-XXX	HALLWAY			

SCHEDULE - FIFTH FLOOR PLAN B

POINT #	CLOSET DESIGNATION	VOICE LOCATION	DATA LOCATION	ROOM #	CAMERA #	WIRELESS ACCESS POINT	POLE #



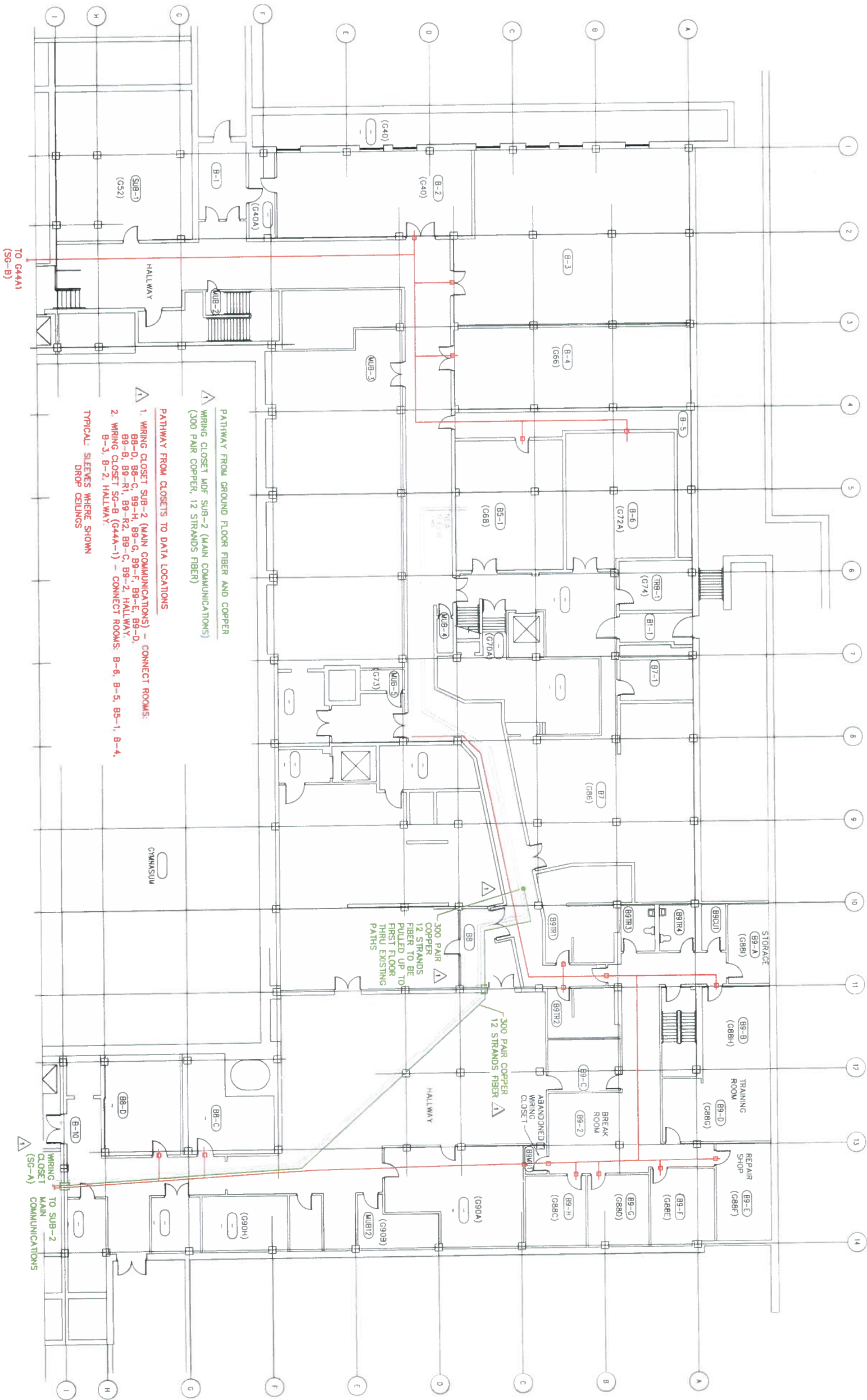
REVISIONS
<div>△</div> FEBRUARY, 2012

DESIGN FIRM
TELECO SYSTEMS, INC.
ROBERT M. FREDERICK Vice President P.E. No. 354213 Wisconsin www.telecoinc.com

DRAWN BY
PAR
SCALE:
AS NOTED
DATE
OCTOBER 2011
PROJECT
0606-07445
SITE NO:
240
REVISION NO
39

LEGEND
FIBER & 100 PAIR RUN
COPPER RUN
PREVIOUS CONTRACT

(117) - INDICATES NEW ROOM NUMBER
(136) - INDICATES OLD ROOM NUMBER
PRT - PRINTER
NOTES:
CABLE TO RUN ABOVE CEILING
OUT TO MAIN HALLWAY
AND OVER TO MU-CLOSET.



SAFETY BUILDING - GROUND FLOOR PLAN
SCALE: 1/8" = 1'-0" (8.50" x 4.27")

BID DOCUMENT
SHEET DESCRIPTION:
GROUND FLOOR PLAN A - CABLING

WIRING CLOSETS AND FIBER & COPPER RUNS HAVE BEEN
LOCATED AND APPROVED BY THE MILWAUKEE COUNTY
DEPARTMENT OF TRANSPORTATION AND PUBLIC WORKS

REVISIONS	Δ FEBRUARY, 2012
DESIGN FIRM	TELECO SYSTEMS, INC.
DESIGNER	HEATH HILL, PRESIDENT
PROJECT	7771 KOSWATZ RD. MILWAUKEE, WI 53212 TEL: 414.362.4242 WWW.TELECOSYSTEMS.COM
DRAWN BY:	PAR
SCALE	AS NOTED
DATE	OCTOBER, 2011
PROJECT	0609-07445
SHEET NO.	240
BUILDING NO.	30
SHEET NO.	TC35



Milwaukee County Courthouse
Safety Building Telecommunications Design

MILWAUKEE COUNTY DEPARTMENT OF
TRANSPORTATION AND PUBLIC WORKS
CITY CAMPUS 2711 W. WELLS ST. SECOND FLOOR MILWAUKEE, WI 53208

117 - INDICATES NEW ROOM NUMBER
(136) - INDICATES OLD ROOM NUMBER
PRT - PRINTER

NOTES:
CABLE TO RUN ABOVE CEILING
OUT TO MAIN HALLWAY
AND OVER TO MU-CLOSET

SAFETY BUILDING - GROUND FLOOR PLAN

BID DOCUMENT

SHEET DESCRIPTION:

GROUND FLOOR PLAN B - CABLING

BID DOCUMENT

SHEET DESCRIPTION:

GROUND FLOOR PLAN B -- CABLING

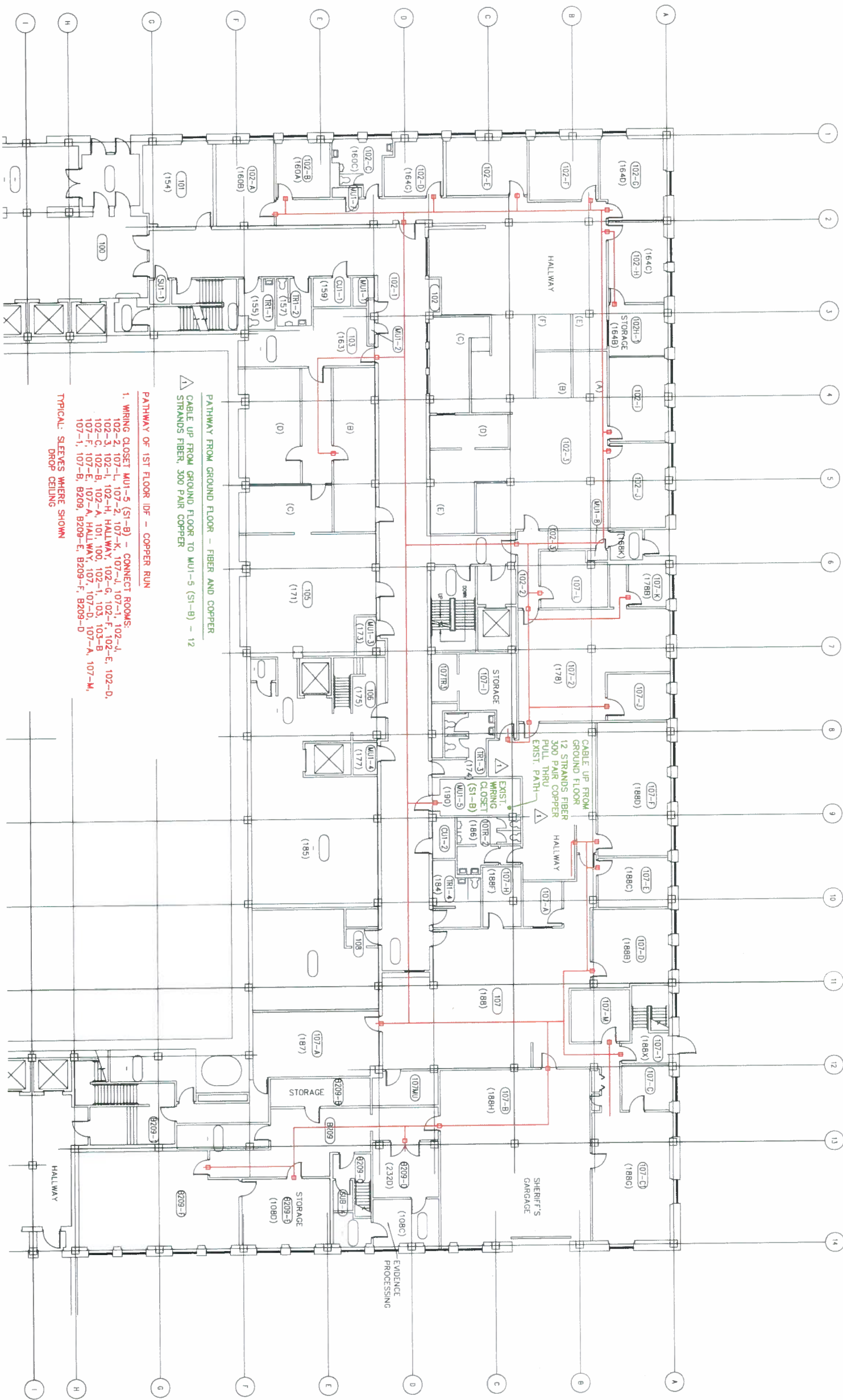
REVISIONS	1	FEBRUARY, 2012
DESIGN FIRM	TELECO SYSTEMS, INC.	
	ROBERT WEL, PRESIDENT 777 BROADWAY, 203 NEW YORK, NY 10003 TEL: 212-512-2000 FAX: 212-512-2001 WWW.TELECO-SYSTEMS.COM	
	DRAWN BY: PAR	
	SCALE: AS NOTED	
	DATE: OCTOBER 2011	
	PROJECT: 0606-07445	
	SITE NO.: 240	
	BUILDING NO.: 30	
	SHEET NO. TC36	

MILWAUKEE COUNTY DEPARTMENT OF
TRANSPORTATION AND PUBLIC WORKS

CITY CAMPUS 2711 W. WELLS ST. SECOND FLOOR MILWAUKEE, WI 53208



Milwaukee County Courthouse Safety Building Telecommunications Design



Milwaukee County Courthouse
Safety Building Telecommunications Design

MILWAUKEE COUNTY DEPARTMENT OF
TRANSPORTATION AND PUBLIC WORKS
CITY CAMPUS 2711 W. WELLS ST. SECOND FLOOR MILWAUKEE, WI 53208

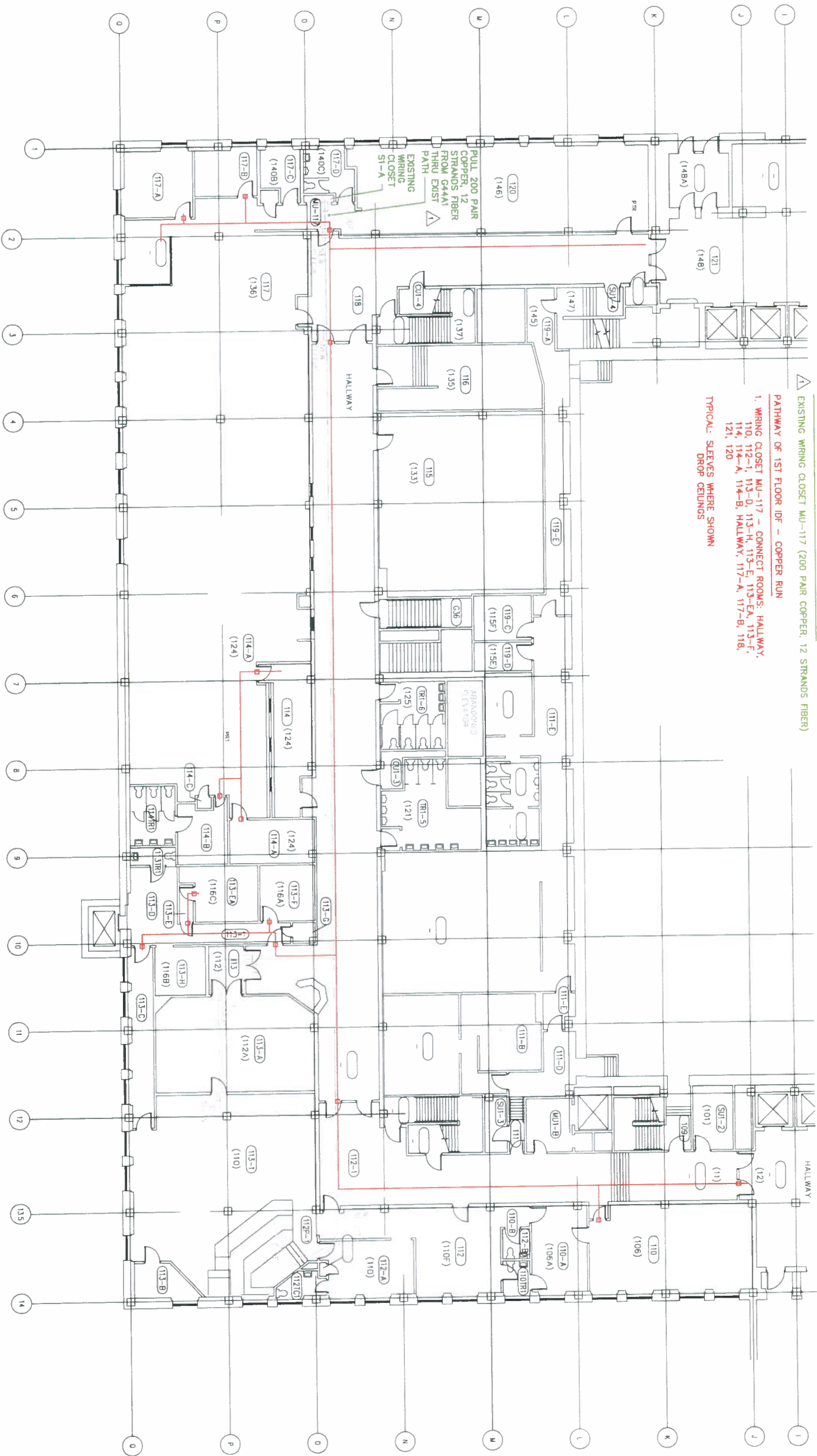
REVISIONS
1 FEBRUARY 2012

DESIGN FIRM
TELECO SYSTEMS, INC.
1777 BROADWAY, SUITE 200
MILWAUKEE, WI 53233
PHONE: 414.381.8100
WWW.TELECO-SYSTEMS.COM

WIRING CLOSETS AND FIBER & COPPER RUNS HAVE BEEN
LOCATED AND APPROVED BY THE MILWAUKEE COUNTY
DEPARTMENT OF TRANSPORTATION AND PUBLIC WORKS.

BID DOCUMENT
SHEET NO. 30
FIRST FLOOR PLAN A - CABLING

TC37



PATHWAY FROM GROUND FLOOR FIBER AND COPPER
EXISTING WIRING CLOSET MU-117 (200 PAIR COPPER, 12 STRANDS FIBER)
PATHWAY OF 1ST FLOOR IDF - COPPER RUN
1. WIRING CLOSET MU-117 - CONNECT ROOMS: HALLWAY,
110, 112-1, 113-D, 113-H, 113-E, 113-EA, 113-F,
114, 114-A, 114-B, HALLWAY, 117-A, 117-B, 118,
121, 120
TYPICAL: SLEEVES WHERE SHOWN
DROP CEILINGS

SAFETY BUILDING - FIRST FLOOR PLAN

SCALE: 1/8" = 1'-0" (8'00" x 4'00")

LEGEND
- FIBER & 100 PAIR RUN
- COPPER RUN
- PREVIOUS CONTRACT

NOTES:
CABLE TO RUN ABOVE CEILING
OUT TO MAIN HALLWAY
AND OVER TO MU-CLOSET.

WIRING CLOSETS AND FIBER & COPPER RUNS HAVE BEEN
LOCATED AND APPROVED BY THE MILWAUKEE COUNTY
DEPARTMENT OF TRANSPORTATION AND PUBLIC WORKS.
BID DOCUMENT
SHEET DESCRIPTION:
FIRST FLOOR PLAN B - CABLING

MILWAUKEE COUNTY DEPARTMENT OF
TRANSPORTATION AND PUBLIC WORKS

CITY CAMPUS 2711 W. WELLS ST. SECOND FLOOR MILWAUKEE, WI 53208



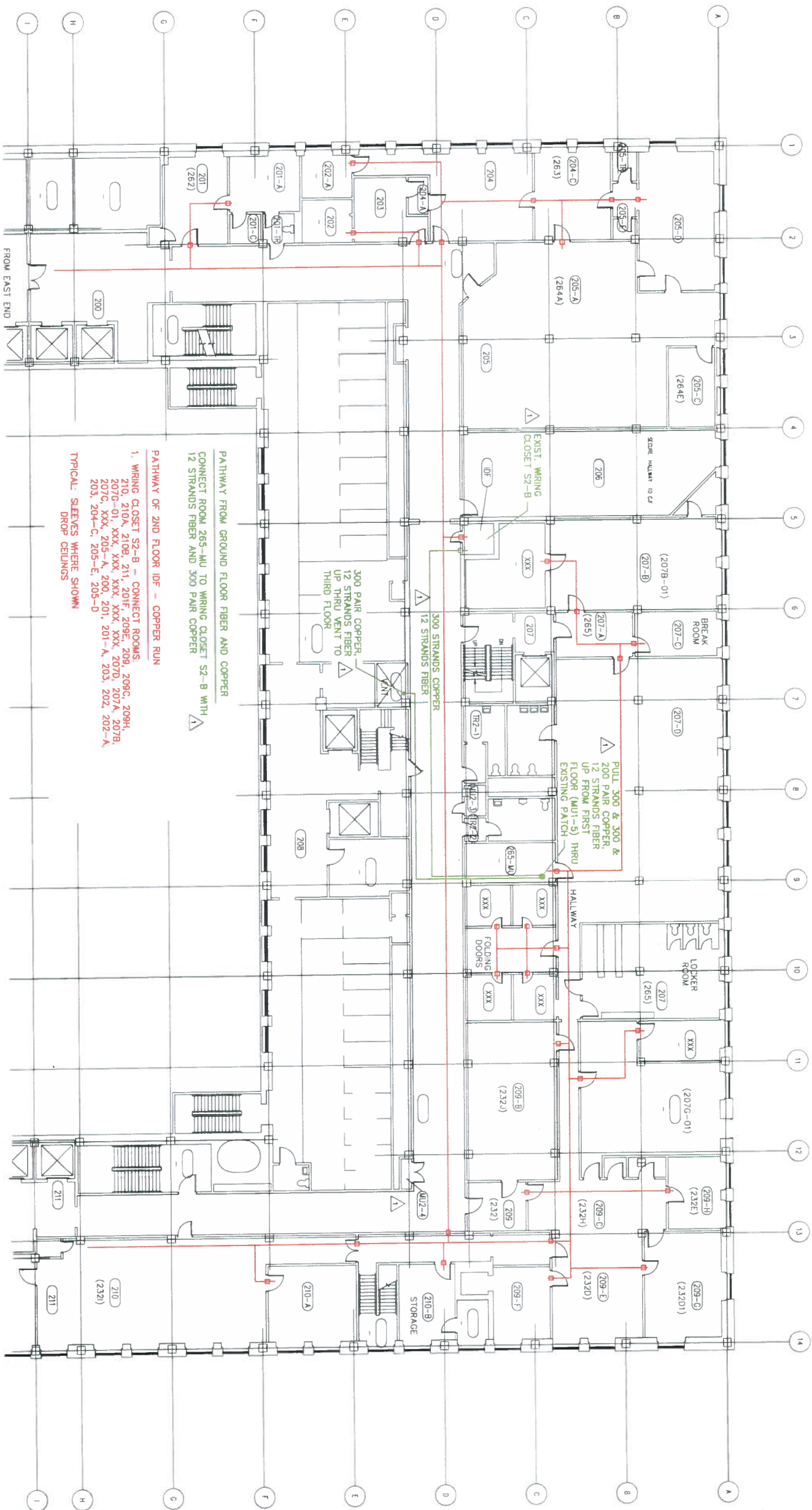
Milwaukee County Courthouse
Safety Building Telecommunications Design

REVISIONS
FEBRUARY, 2012

DESIGN FIRM
TELECO SYSTEMS, INC.
1771 W. WISCONSIN ST.
MILWAUKEE, WI 53233
TEL: 414.224.4444
FAX: 414.224.4444
WWW.TELECO-SYSTEMS.COM

DATE
OCTOBER 2011
PROJECT
SC00-0140
SITE NO.
BUILDING NO.
30

SHEET NO.
TC38



LEGEND

- FIBER & 100 PAIR RUN
- COPPER RUN
- PREVIOUS CONTRACT

(117) - INDICATES NEW ROOM NUMBER
(136) - INDICATES OLD ROOM NUMBER

NOTES:

CABLE TO RUN ABOVE CEILING
OUT TO MAIN HALLWAY
AND OVER TO MU-CLOSET.

SAFETY BUILDING - SECOND FLOOR PLAN

SCALE: 1/8" = 1'-0" (8'0" x 4'7")

WIRING CLOSETS AND FIBER & COPPER RUNS HAVE BEEN
LOCATED AND APPROVED BY THE MILWAUKEE COUNTY
DEPARTMENT OF TRANSPORTATION AND PUBLIC WORKS

BID DOCUMENT

SHEET DESCRIPTION:
SECOND FLOOR PLAN A - CABLING

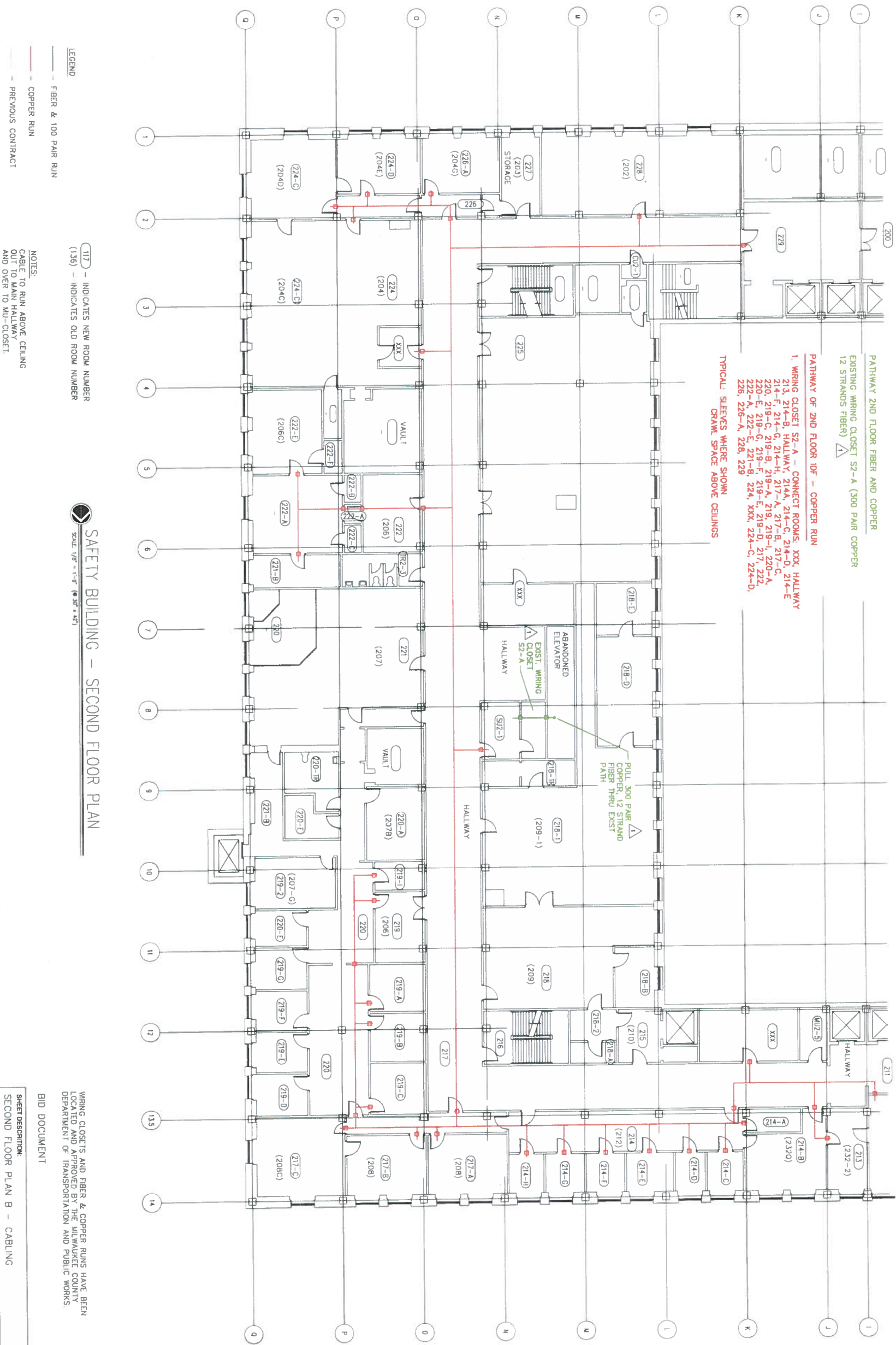
REVISIONS	
△	FEBRUARY 2012
DESIGN FIRM	TELECO SYSTEMS, INC.
DESIGNER	ADAM REIL, PROJECT
DRAWN BY	ADAM REIL, PROJECT
DATE	OCTOBER 2011
PROJECT	0006-07445
SITE NO.	240
BUILDING NO.	30
SHEET NO.	TC39



Milwaukee County Courthouse
Safety Building Telecommunications Design

MILWAUKEE COUNTY DEPARTMENT OF
TRANSPORTATION AND PUBLIC WORKS

CITY CAMPUS 2711 W. WELLS ST. SECOND FLOOR MILWAUKEE, WI 53208



WIRING CLOSETS AND FIBER & COPPER RUNS HAVE BEEN LOCATED AND APPROVED BY THE MILWAUKEE COUNTY DEPARTMENT OF TRANSPORTATION AND PUBLIC WORKS.

BID DOCUMENT

SHEET DESCRIPTION:
SECOND FLOOR PLAN B - CABLING

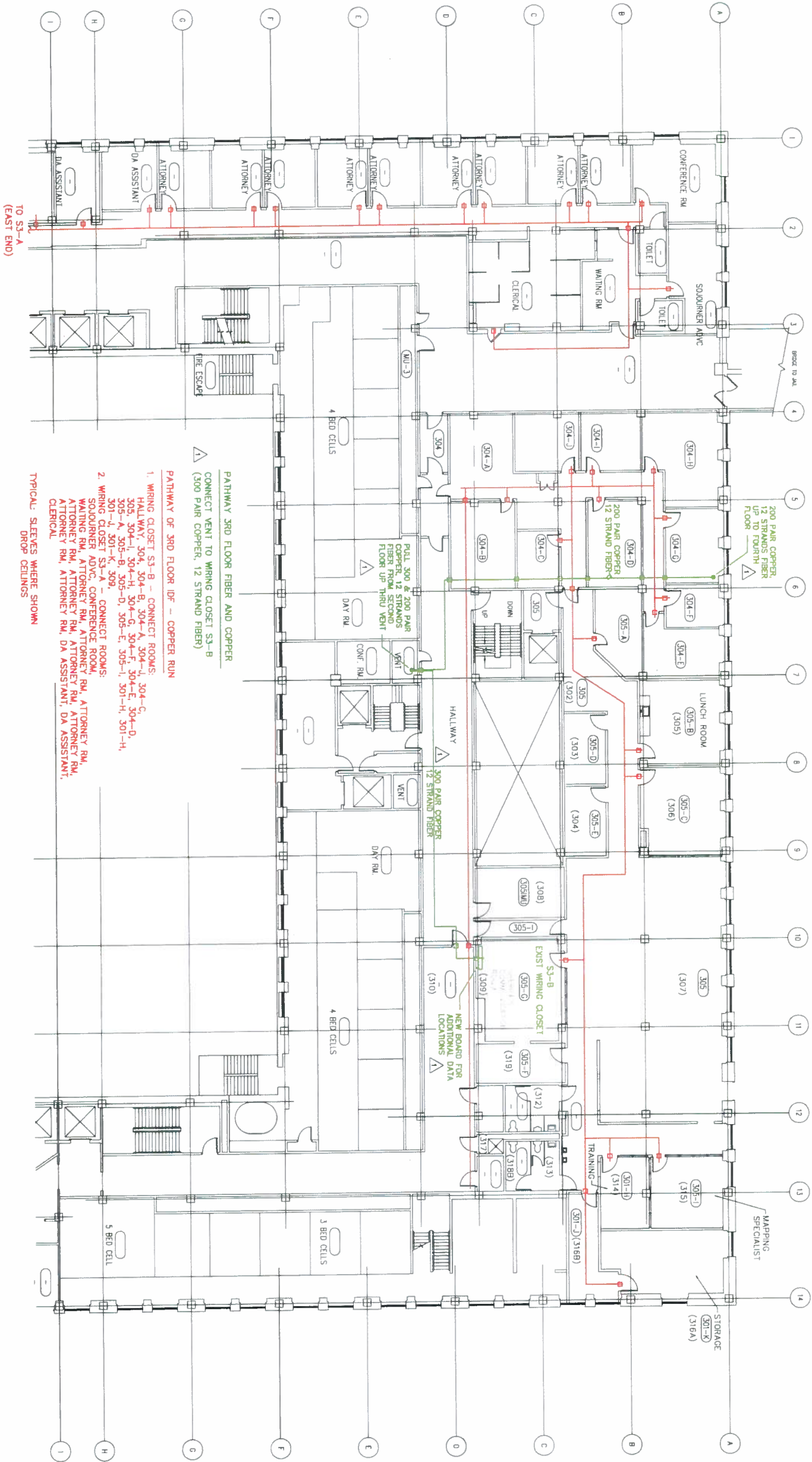
DESIGN FIRM	TELECO SYSTEMS, INC.
PROJECT	MILWAUKEE COUNTY DEPARTMENT OF TRANSPORTATION AND PUBLIC WORKS
DATE	OCTOBER 2011
PROJECT	0006-0745
SITE NO.	240
BUILDING NO.	30
SHEET NO.	TC40

MILWAUKEE COUNTY DEPARTMENT OF TRANSPORTATION AND PUBLIC WORKS

CITY CAMPUS 2711 W. WELLS ST. SECOND FLOOR MILWAUKEE, WI 53208



Milwaukee County Courthouse
Safety Building Telecommunications Design



SAFETY BUILDING - THIRD FLOOR PLAN

WIRING CLOSETS AND FIBER & COPPER RUNS HAVE BEEN LOCATED AND APPROVED BY THE MILWAUKEE COUNTY DEPARTMENT OF TRANSPORTATION AND PUBLIC WORKS.

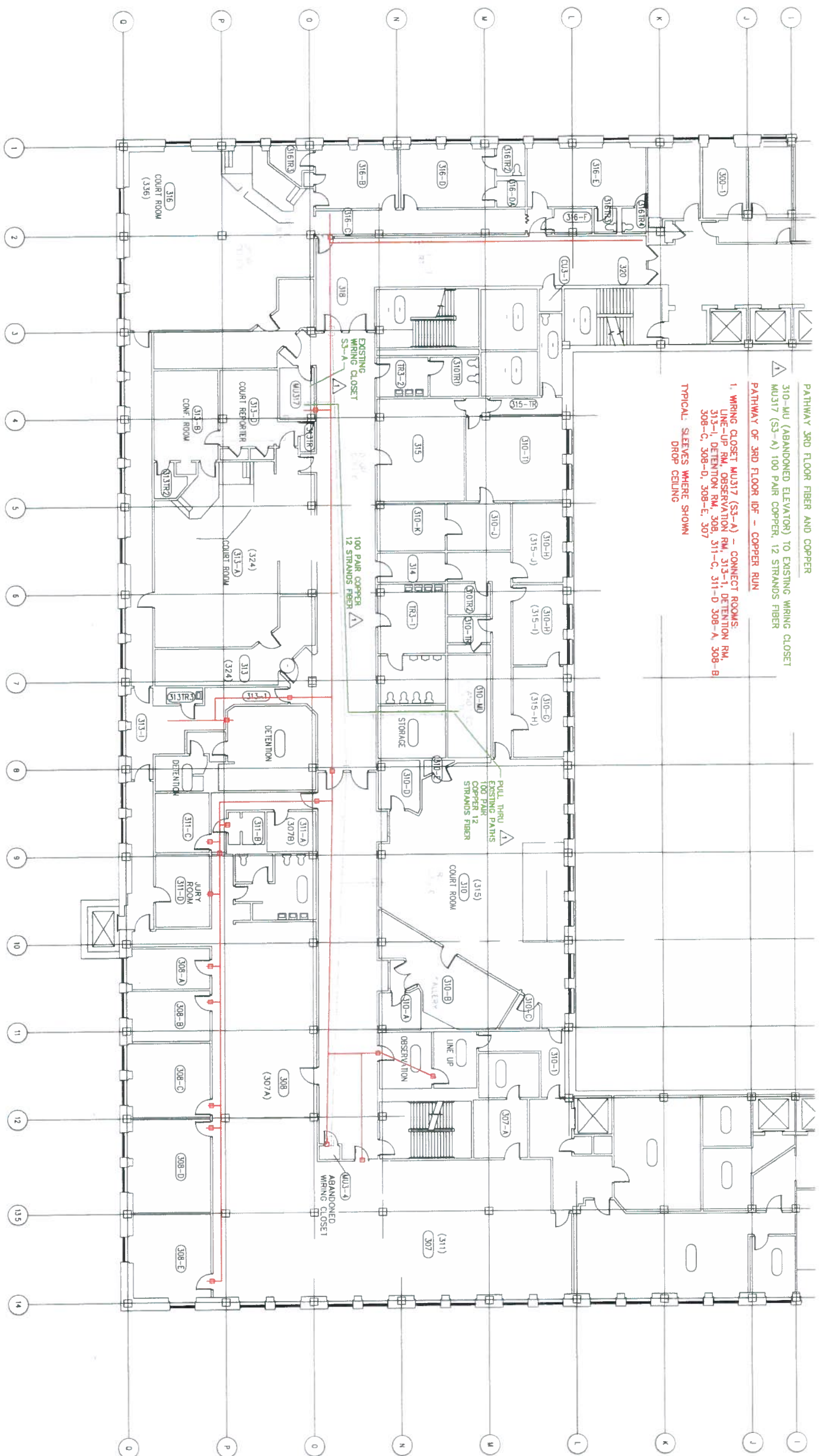
BID DOCUMENT
THIRD FLOOR PLAN A - CABLING

DESIGN FIRM	TELECO SYSTEMS, INC.
CLIENT	MILWAUKEE COUNTY DEPARTMENT OF TRANSPORTATION AND PUBLIC WORKS
PROJECT	SAFETY BUILDING TELECOMMUNICATIONS DESIGN
SHEET NO.	TC42
BUILDING NO.	30
DATE	OCTOBER, 2011
SCALE	AS NOTED
DRAWN BY	PAR
CHECKED BY	PAR
DATE	OCTOBER, 2011
PROJECT	0606-0745
SHEET NO.	240
BUILDING NO.	30
SHEET NO.	TC42

MILWAUKEE COUNTY DEPARTMENT OF TRANSPORTATION AND PUBLIC WORKS
CITY CAMPUS 2711 W. WELLS ST. SECOND FLOOR MILWAUKEE, WI 53208



Milwaukee County Courthouse
Safety Building Telecommunications Design



PATHWAY 3RD FLOOR FIBER AND COPPER
 310-JUL (ABANDONED ELEVATION) TO EXISTING WIRING CLOSET
 MU317 (S3-A) 100 PAIR COPPER, 12 STRANDS FIBER
 PATHWAY OF 3RD FLOOR IDF - COPPER RUN
 1. WIRING CLOSET MU317 (S3-A) - CONNECT ROOMS:
 LINE-UP RM. OBSERVATION RM., 313-1 DETENTION RM.,
 313-1 DETENTION RM., 308-1, 311-C, 311-D 308-A, 308-B,
 308-C, 308-D, 308-E, 307
 TYPICAL: SLEEVES WHERE SHOWN
 DROP CEILING

--	--	--

ABANDONED
WRING CLOSET

SAFETY BUILDING - THIRD FLOOR PLAN

SCALE 1/8" = 1'-0" (@ 30° = 42°)

LEGEND

(117)	- INDICATES NEW ROOM NUMBER
(136)	- INDICATES OLD ROOM NUMBER
- FIBER & 100 PAIR RUN	

PRI - PRINTER


- PREVIOUS CONTRACT

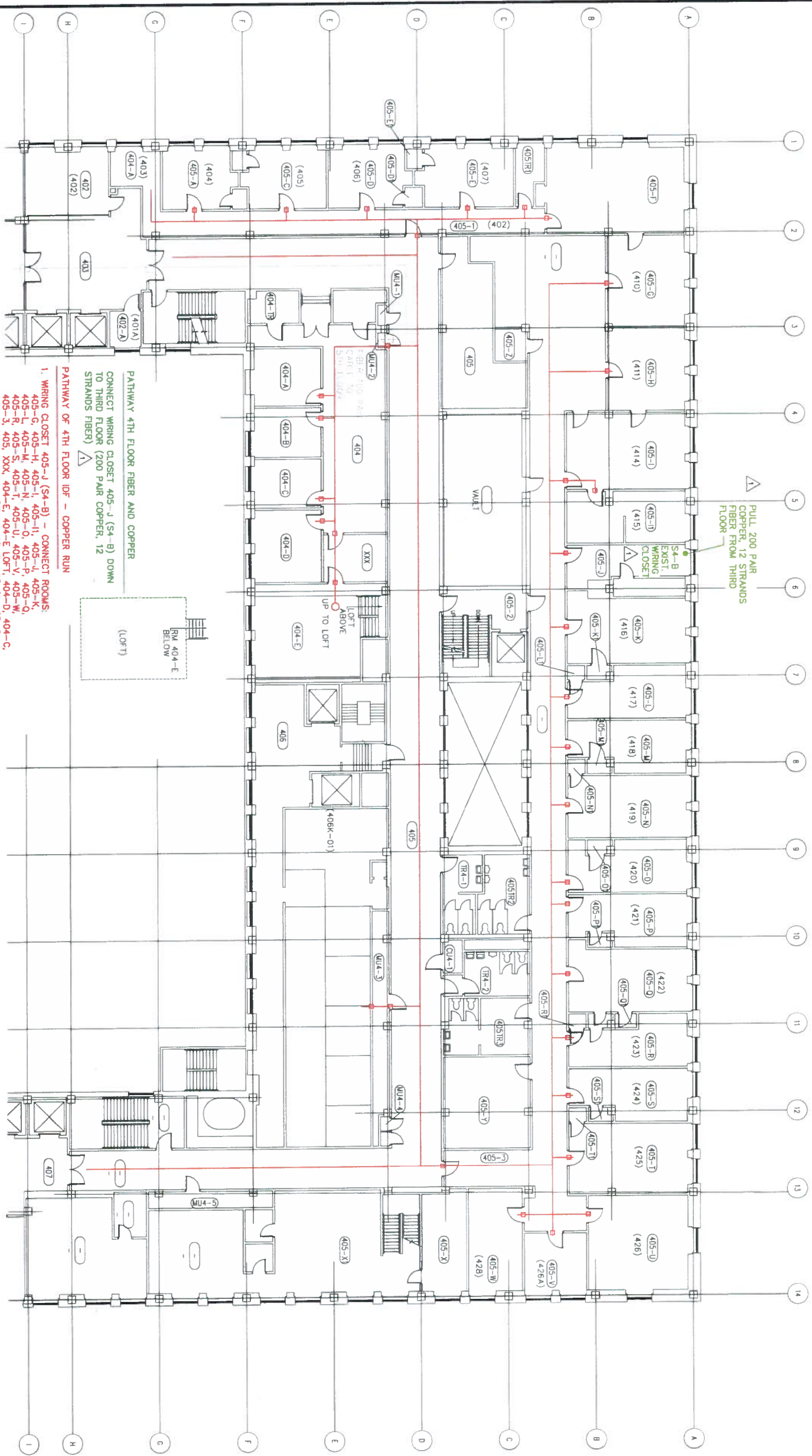
NOTES:
CABLE TO RUN ABOVE CEILING
OUT TO MAIN HALLWAY
AND OVER TO MU-CLOSET

BID DOCUMENT

SHEET DESCRIPTION:
THIRD FLOOR PLAN B - CABLING

WIRING CLOSETS AND FIBER & COPPER RUNS HAVE BEEN LOCATED AND APPROVED BY THE MILWAUKEE COUNTY DEPARTMENT OF TRANSPORTATION AND PUBLIC WORKS.

REVISIONS FEBRUARY, 2012	MILWAUKEE COUNTY DEPARTMENT OF TRANSPORTATION AND PUBLIC WORKS	
	CITY CAMPUS 2711 W. WELLS ST. SECOND FLOOR, MILWAUKEE, WI 53208	



1. WIRING CLOSET 405-J (S4-B) - CONNECT ROOMS:
405-G, 405-H, 405-I, 405-J, 405-K,
405-L, 405-M, 405-N, 405-O, 405-P, 405-Q,
405-R, 405-S, 405-T, 405-U, 405-V, 405-W,
405-X, 405-Y, 405-Z, 405-AA, 405-AB, 405-AC,
405-AD, 405-AE, 405-AF, 405-AG, 405-AH,
405-AI, 405-AJ, 405-AK, 405-AL, 405-AM,
405-AN, 405-AO, 405-AP, 405-AQ, 405-AR,
405-AS, 405-AT, 405-AU, 405-AV, 405-AW,
405-AX, 405-AY, 405-AZ, 405-BA, 405-BB,
405-BC, 405-BD, 405-BE, 405-BF, 405-BG,
405-BH, 405-BI, 405-BJ, 405-BK, 405-BL,
405-BM, 405-BN, 405-BO, 405-BP, 405-BQ,
405-BR, 405-BS, 405-BT, 405-BU, 405-BV,
405-BW, 405-BX, 405-BY, 405-BZ, 405-CA,
405-CC, 405-CD, 405-CE, 405-CF, 405-CG,
405-CH, 405-CI, 405-CJ, 405-CK, 405-CL,
405-CM, 405-CN, 405-CO, 405-CP, 405-CQ,
405-CR, 405-CS, 405-CT, 405-CU, 405-CV,
405-CW, 405-CX, 405-CY, 405-CZ, 405-DA,
405-DB, 405-DC, 405-DD, 405-DE, 405-DF,
405-DG, 405-DH, 405-DI, 405-DJ, 405-DK,
405-DM, 405-DN, 405-DO, 405-DP, 405-DQ,
405-DR, 405-DS, 405-DT, 405-DU, 405-DV,
405-DW, 405-DX, 405-DY, 405-DZ, 405-EA,
405-EB, 405-EC, 405-ED, 405-EE, 405-EF,
405-EG, 405-EH, 405-EI, 405-EJ, 405-EK,
405-EM, 405-EN, 405-EO, 405-EP, 405-EQ,
405-ER, 405-ES, 405-ET, 405-EU, 405-EV,
405-EW, 405-EX, 405-EY, 405-EZ, 405-FA,
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405-FH, 405-FI, 405-FJ, 405-FK, 405-FL,
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405-GB, 405-GC, 405-GD, 405-GE, 405-GF,
405-GG, 405-GH, 405-GI, 405-GJ, 405-GK,
405-GM, 405-GN, 405-GO, 405-GP, 405-GQ,
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405-HG, 405-HH, 405-HI, 405-HJ, 405-HK,
405-HM, 405-HN, 405-HO, 405-HP, 405-HQ,
405-HR, 405-HS, 405-HT, 405-HU, 405-HV,
405-HW, 405-HX, 405-HY, 405-HZ, 405-IA,
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405-IG, 405-IH, 405-II, 405-IJ, 405-IK,
405-IM, 405-IN, 405-IO, 405-IP, 405-IQ,
405-IR, 405-IS, 405-IT, 405-IU, 405-IV,
405-IW, 405-IX, 405-IY, 405-IZ, 405-JA,
405-JB, 405-JC, 405-JD, 405-JE, 405-JF,
405-JG, 405-JH, 405-JI, 405-JJ, 405-JK,
405-JM, 405-JN, 405-JO, 405-JP, 405-JQ,
405-JR, 405-JS, 405-JT, 405-JU, 405-JV,
405-JW, 405-JX, 405-JY, 405-JZ, 405-KA,
405-KB, 405-KC, 405-KD, 405-KE, 405-KF,
405-KG, 405-KH, 405-KI, 405-KJ, 405-KK,
405-KM, 405-KN, 405-KO, 405-KP, 405-KQ,
405-KR, 405-KS, 405-KT, 405-KU, 405-KV,
405-KW, 405-KX, 405-KY, 405-KZ, 405-LA,
405-LB, 405-LC, 405-LD, 405-LE, 405-LF,
405-LG, 405-LH, 405-LI, 405-LJ, 405-LK,
405-LM, 405-LN, 405-LO, 405-LP, 405-LQ,
405-LR, 405-LS, 405-LT, 405-LU, 405-LV,
405-LW, 405-LX, 405-LY, 405-LZ, 405-MA,
405-MB, 405-MC, 405-MD, 405-ME, 405-MF,
405-MG, 405-MH, 405-MI, 405-MJ, 405-MK,
405-MM, 405-MN, 405-MO, 405-MP, 405-MQ,
405-MR, 405-MS, 405-MT, 405-MU, 405-MV,
405-MW, 405-MX, 405-MY, 405-MZ, 405-NA,
405-NB, 405-NC, 405-ND, 405-NE, 405-NF,
405-NG, 405-NH, 405-NI, 405-NJ, 405-NK,
405-NM, 405-NN, 405-NO, 405-NP, 405-NQ,
405-NR, 405-NS, 405-NT, 405-NU, 405-NV,
405-NW, 405-NX, 405-NY, 405-NZ, 405-OA,
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405-OG, 405-OH, 405-OI, 405-OJ, 405-OK,
405-OM, 405-ON, 405-OO, 405-OP, 405-OQ,
405-OR, 405-OS, 405-OT, 405-OU, 405-OV,
405-OW, 405-OX, 405-OY, 405-OZ, 405-PA,
405-PB, 405-PC, 405-PD, 405-PE, 405-PF,
405-PG, 405-PH, 405-PI, 405-PJ, 405-PK,
405-PM, 405-PN, 405-PO, 405-PP, 405-PQ,
405-PR, 405-PS, 405-PT, 405-PU, 405-PV,
405-PW, 405-PX, 405-PY, 405-PZ, 405-QA,
405-QB, 405-QC, 405-QD, 405-QE, 405-QF,
405-QG, 405-QH, 405-QI, 405-QJ, 405-QK,
405-QM, 405-QN, 405-QO, 405-QP, 405-QQ,
405-QR, 405-QS, 405-QT, 405-QU, 405-QV,
405-QW, 405-QX, 405-QY, 405-QZ, 405-RA,
405-RB, 405-RC, 405-RD, 405-RE, 405-RF,
405-RG, 405-RH, 405-RI, 405-RJ, 405-RK,
405-RM, 405-RN, 405-RO, 405-RP, 405-RQ,
405-RR, 405-RS, 405-RT, 405-RU, 405-RV,
405-RW, 405-RX, 405-RY, 405-RZ, 405-SA,
405-SB, 405-SC, 405-SD, 405-SE, 405-SF,
405-SG, 405-SH, 405-SI, 405-SJ, 405-SK,
405-SM, 405-SN, 405-SO, 405-SP, 405-SQ,
405-SR, 405-SS, 405-ST, 405-SU, 405-SV,
405-SW, 405-SX, 405-SY, 405-SZ, 405-TA,
405-TB, 405-TC, 405-TD, 405-TE, 405-TF,
405-TG, 405-TH, 405-TI, 405-TJ, 405-TK,
405-TM, 405-TN, 405-TO, 405-TP, 405-TQ,
405-TR, 405-TS, 405-TT, 405-TU, 405-TV,
405-TW, 405-TX, 405-TY, 405-TZ, 405-UA,
405-UB, 405-UC, 405-UD, 405-UE, 405-UF,
405-UG, 405-UH, 405-UI, 405-UJ, 405-UK,
405-UM, 405-UN, 405-UO, 405-UP, 405-UQ,
405-UR, 405-US, 405-UT, 405-UY, 405-UZ,
405-VA, 405-VB, 405-VC, 405-VD, 405-VE,
405-VF, 405-VG, 405-VH, 405-VI, 405-VJ,
405-VK, 405-VM, 405-VN, 405-VO, 405-VP,
405-VQ, 405-VR, 405-VS, 405-VT, 405-VU,
405-VV, 405-VW, 405-VX, 405-VY, 405-VZ,
405-WA, 405-WB, 405-WC, 405-WD, 405-WE,
405-WF, 405-WG, 405-WH, 405-WI, 405-WJ,
405-WK, 405-WM, 405-WN, 405-WO, 405-WP,
405-WQ, 405-WS, 405-WT, 405-WU, 405-WV,
405-WX, 405-WY, 405-WZ, 405-XA, 405-XB,
405-XC, 405-XD, 405-XE, 405-XF, 405-XG,
405-XH, 405-XI, 405-XJ, 405-XK, 405-XM,
405-XN, 405-XO, 405-XP, 405-XQ, 405-XR,
405-XS, 405-XT, 405-XU, 405-XV, 405-XW,
405-XX, 405-XY, 405-XZ, 405-YA, 405-YB,
405-YC, 405-YD, 405-YE, 405-YF, 405-YG,
405-YH, 405-YI, 405-YJ, 405-YK, 405-YM,
405-YN, 405-YO, 405-YP, 405-YQ, 405-YR,
405-YS, 405-YT, 405-YU, 405-YV, 405-YW,
405-YX, 405-YY, 405-YZ, 405-ZA, 405-ZB,
405-ZC, 405-ZD, 405-ZE, 405-ZF, 405-ZG,
405-ZH, 405-ZI, 405-ZJ, 405-ZK, 405-ZM,
405-ZN, 405-ZO, 405-ZP, 405-ZQ, 405-ZR,
405-ZS, 405-ZT, 405-ZU, 405-ZV, 405-ZW,
405-ZX, 405-ZY, 405-ZZ

SAFETY BUILDING - FOURTH FLOOR

WIRING CLOSETS AND FIBER & COPPER RUNS HAVE BEEN
LOCATED AND APPROVED BY THE MANAGER, POLICE
DEPARTMENT OF TRANSPORTATION AND PUBLIC WORKS.

BID DOCUMENT

SHEET DESCRIPTION:
FOURTH FLOOR PLAN A - CABLING

REVISIONS

△ FEBRUARY, 2012

DESIGN FIRM

TELECO SYSTEMS, INC.

1771 BOWLING GREEN BLVD.
MILWAUKEE, WISCONSIN 53207
TEL: (414) 224-4444
WWW.TELECO-SYSTEMS.COM

DRAWN BY:

PAH

SCALE

AS NOTED

DATE

NOVEMBER 2011

PROJECT

0606-0746

SHEET NO.

240

BUILDING NO.

30

SHEET NO.

TC45

MILWAUKEE COUNTY DEPARTMENT OF
TRANSPORTATION AND PUBLIC WORKS

CITY CAMPUS 2711 W. WELLS ST. SECOND FLOOR MILWAUKEE, WI 53206

Milwaukee County Courthouse
Safety Building Telecommunications Design

117 - INDICATES NEW ROOM NUMBER
(136) - INDICATES OLD ROOM NUMBER

SAFETY BUILDING - FOURTH FLOOR

WINING CISTS AND FIBER & COPPER RUNS HAVE BEEN
LOCATED AND APPROVED BY THE MILWAUKEE COUNTY
DEPARTMENT OF TRANSPORTATION AND PUBLIC WORKS

DESIGN FIRM	777 BOWLING CT. MARIETTA, GA 30067 Tel 404-584-4422 Fax 404-584-4423 www.teleco-systems.com
TELECO SYSTEMS, INC.	16001 HWY. 100, SUITE 200 DALLAS, TX 75244 Tel 214-343-4400 Fax 214-343-4401 www.teleco-systems.com
DRAWN BY:	PAR
AS NOTED	DATE
PROJECT	OCTOBER 2011
SITE NO.	0606-07445
	2440
BUILDING NO.:	30
SHEET NO.	TC46

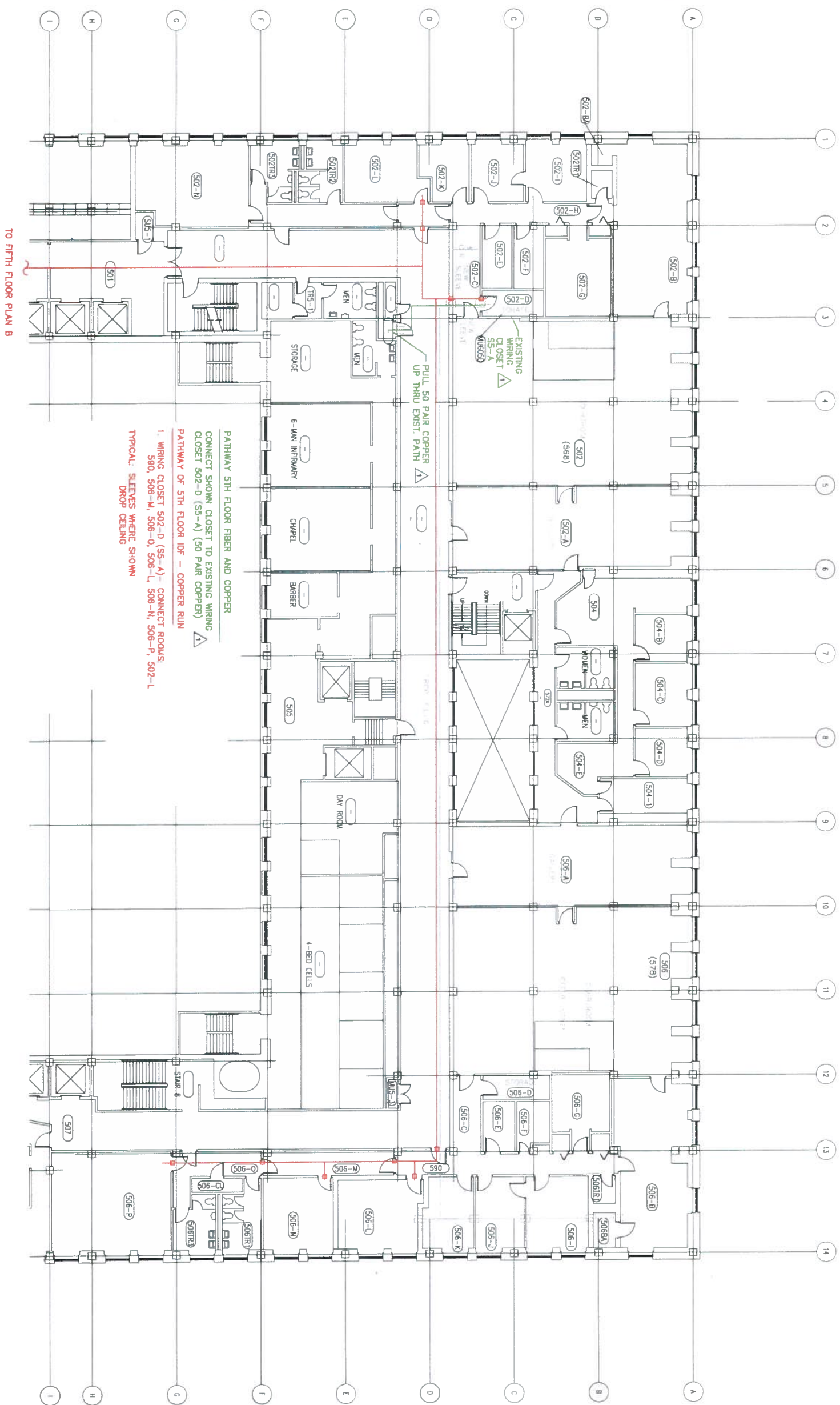
REVISIONS	
1	FEBRUARY, 2012

MILWAUKEE COUNTY DEPARTMENT OF
TRANSPORTATION AND PUBLIC WORKS

CITY CAMPUS 2711 W. WELLS ST. SECOND FLOOR MILWAUKEE, WI 53208



Milwaukee County Courthouse Safety Building Telecommunications Design



LEGEND

 - FIBER & 100 PAIR RUN

 - COPPER RUN


 - PREVIOUS CONTRACT

NOTES:

 - INDICATES NEW ROOM NUMBER

(136) - INDICATES OLD ROOM NUMBER

CABLE TO RUN ABOVE CEILING
OUT TO MAIN HALLWAY
AND OVER TO MU-CLOSET

PATHWAY 5TH FLOOR FIBER AND COPPER
 CONNECT SHOWN (CONNECT TO EXISTING WIRING
 CLOSE 502-D) (S5-A) (50 PAIR COPPER)

PATHWAY OF 5TH FLOOR IDF - COPPER RUN
 1. WIRING CLOSE 502-D (S5-A)- CONNECT ROOMS
 580, 506-M, 506-Q, 506-L, 506-N, 506-P, 502-L
 TYPICAL: SLEEVES WHERE SHOWN
 DROP CEILING

SAFETY BUILDING - FIFTH FLOOR PLAN

WIRING CLOSETS AND FIBER & COPPER RUNS HAVE BEEN
LOCATED AND APPROVED BY THE MILWAUKEE COUNTY
DEPARTMENT OF TRANSPORTATION AND PUBLIC WORKS

BID DOCUMENT

SHEET DESCRIPTION:
FIFTH FLOOR PLAN A CABLING


1

REVISIONS

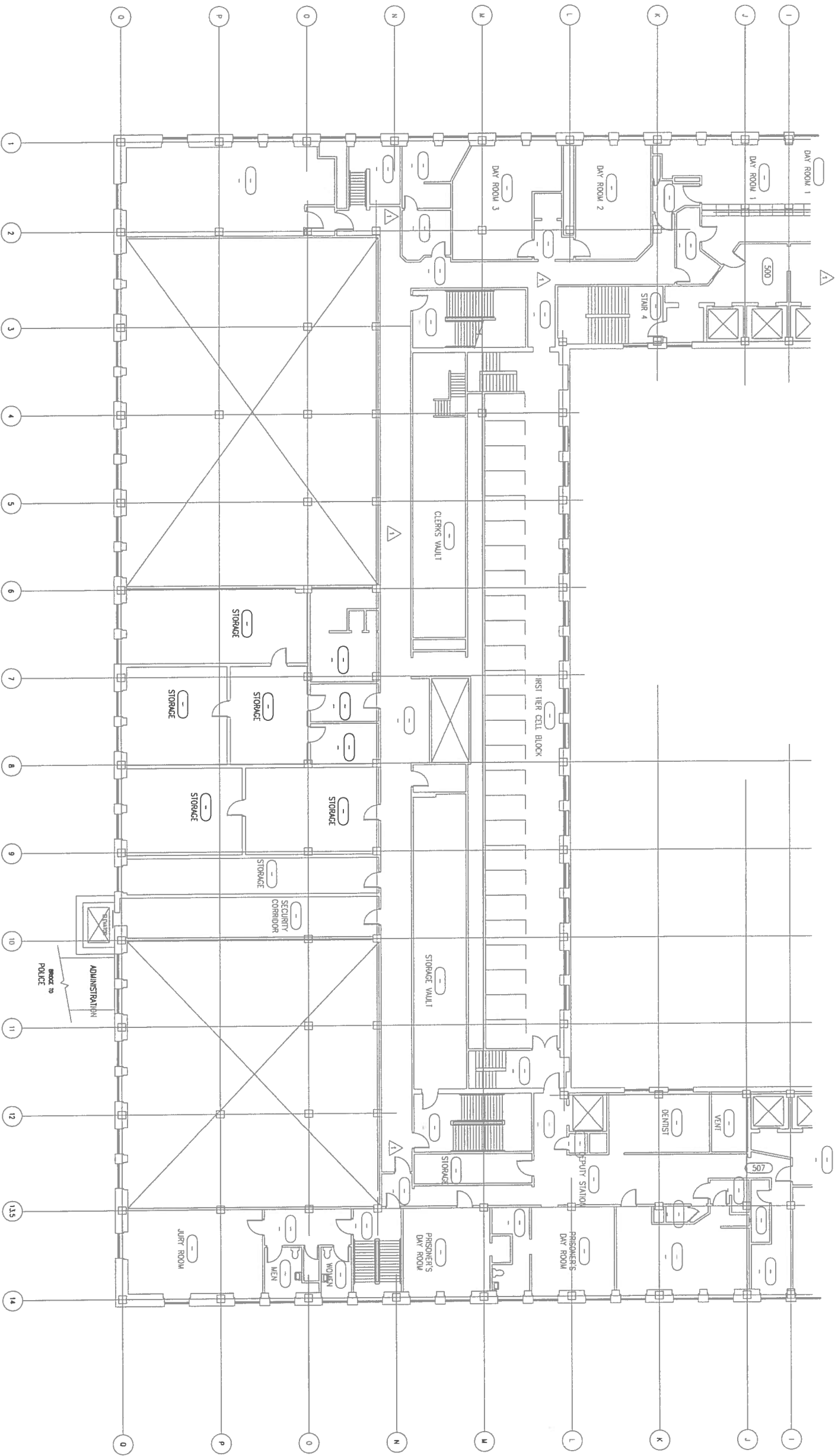
FEBRUARY 2012

**MILWAUKEE COUNTY DEPARTMENT OF
TRANSPORTATION AND PUBLIC WORKS**

CITY CAMPUS 2711 W. WELLS ST. SECOND FLOOR MILWAUKEE, WI 53208



Milwaukee County Courthouse Safety Building Telecommunications Design



LEGEND

— FIBER & 100 PAIR RUN

— COPPER RUN

— PREVIOUS CONTRACT

(17) - INDICATES NEW ROOM NUMBER
(135) - INDICATES OLD ROOM NUMBER

PRT - PRINTER

NOTES:

CABLE TO RUN ABOVE CEILING
OUT MAIN HALLWAY
AND OVER TO NO-CLOSET.

SAFETY BUILDING - FIFTH FLOOR PLAN

SCALE: 1/8" = 1'-0" (8 3/4" x 47)

WRING, CLOSETS AND FIBER & COPPER RUNS HAVE BEEN
LOCATED AND APPROVED BY THE MILWAUKEE COUNTY
DEPARTMENT OF TRANSPORTATION AND PUBLIC WORKS.

BID DOCUMENT

SHEET DESCRIPTION:
FIFTH FLOOR PLAN B - CABLING

Milwaukee County Courthouse
Safety Building Telecommunications Design



MILWAUKEE COUNTY DEPARTMENT OF
TRANSPORTATION AND PUBLIC WORKS

CITY CAMPUS 2711 W WELLS ST. SECOND FLOOR MILWAUKEE, WI 53208

REVISIONS

△ FEBRUARY, 2012

DESIGN FIRM

TELECO SYSTEMS, INC.

1777 KENNEDY BLVD
MILWAUKEE, WISCONSIN 53217
TEL: 414.224.1100
FAX: 414.224.1101

DRAWN BY: PAR

SCALE: AS NOTED

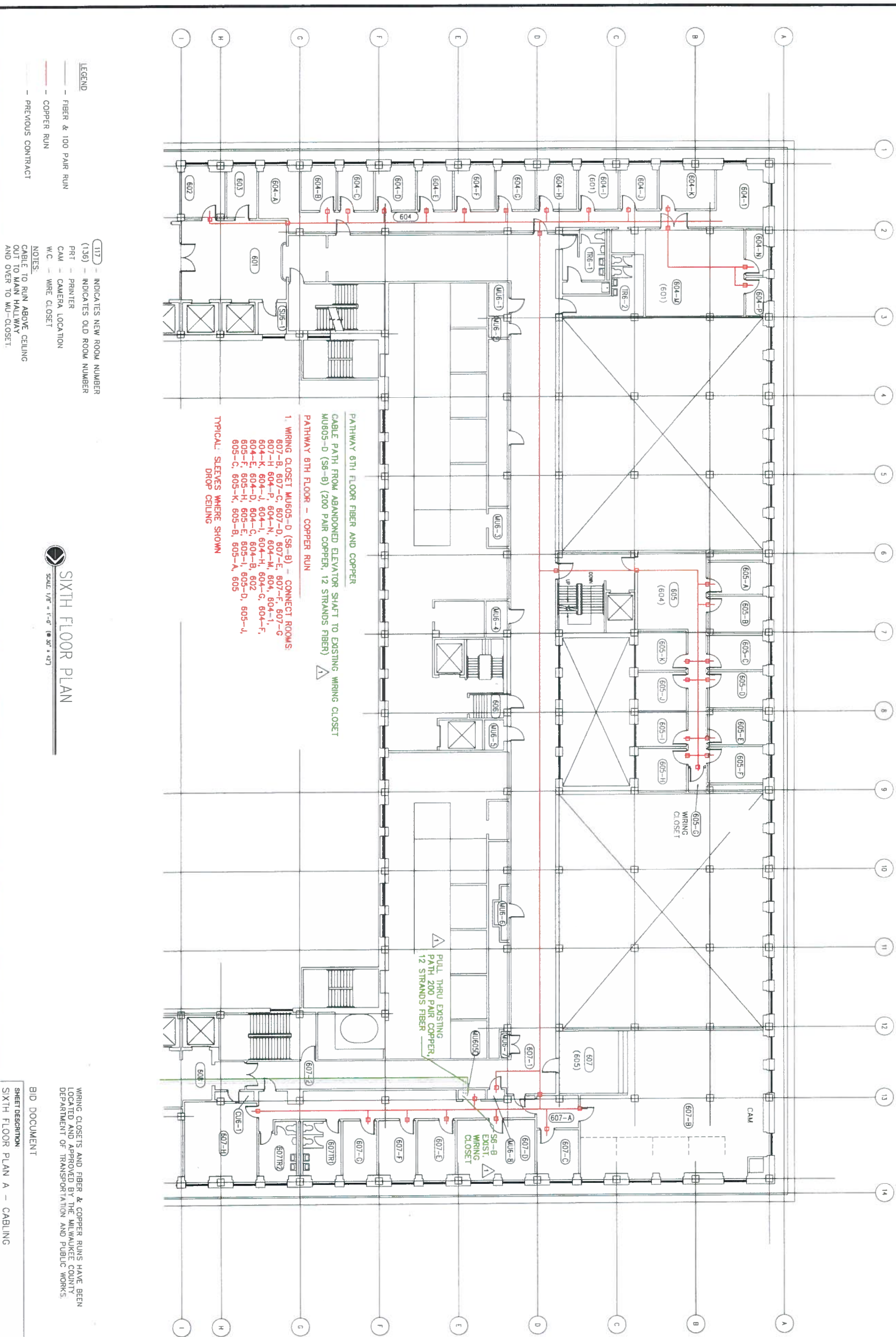
DATE: OCTOBER 2011

PROJECT NO: 100040745

SHEET NO: 240

BUILDING NO: 30

SHEET NO: TC48



Milwaukee County Courthouse Safety Building Telecommunications Design



**MILWAUKEE COUNTY DEPARTMENT OF
TRANSPORTATION AND PUBLIC WORKS**

CITY CAMPUS 2711 W. WELLS ST. SECOND FLOOR MILWAUKEE, WI 53208

REVISIONS	<div style="border: 1px solid black; padding: 2px; display: inline-block;">1</div> FEBRUARY, 2012
-----------	---

DESIGN FIRM

TELECO SYSTEMS, INC.

HEIDI WEL, PRESIDENT

7777 BROADWAY RD.
MILWAUKEE, WISCONSIN 53217
PH. (414) 360-6218
FAX (414) 375-4420

Circle 26 on Reader Service Card

WIRING CLOSETS AND FIBER & COPPER RUNS HAVE BEEN LOCATED AND APPROVED BY THE MILWAUKEE COUNTY DEPARTMENT OF TRANSPORTATION AND PUBLIC WORKS.

BID DOCUMENT
SHEET DESCRIPTION
SIXTH FLOOR PLAN A - CABLING

